# LAND ECONOMICS

*a quarterly journal of*

## PLANNING, HOUSING & PUBLIC UTILITIES

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Changing Patterns of Land Values
*Homer Hoyt*

The Status of Rate Making
*Harvey C. Bunke*

An Analysis of the Italian Agrarian Reform
*Lorenzo Mario Belotti*

Toward a Water Resource Development Program for Eastern Rivers
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*Anthony Downs*

*Public Utilities in American Capitalism* (Martin Glaeser)
Review by Horace M. Gray and Comment by Walter Morton

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## Changing Patterns of Land Values

*By* HOMER HOYT*

PATTERNS of urban land use have been described and analyzed in studies in the fields of land economics, urban geography, and planning and zoning, but there have been few, if any, significant articles written in the past decade on the common denominator of all types of land uses—the pattern of land values. Land value measures the differences in the economic return yielded by every form of land utilization —agricultural, mineral or urban—and the peaks of land value are indicated in a manner readily revealed to the casual observer by tall buildings, concentration of shoppers or workers, or by high-priced homes. The difficulty of securing adequate market data and of separating site value from building value has deterred scholars from investigating a subject that is of vital importance to the appraisal profession. In this article I will not attempt to tabulate land values which vary from block to block in hundreds of cities and from one farm to another in rural areas. It would be a task of gigantic proportions even to show current land values in a single metropolitan area for a single year. Yet there are trends in land value patterns so obvious and of such vital importance that conclusions must be reached and decisions made affecting land values that will not wait until a group of scholars has devoted years of research to the problem.

I propose to call attention to fundamental shifts in land value patterns that have occurred in the United States since 1790 for the purpose of showing that there is no model or principle for distribution of land values applicable to all times and places but that peak land value sites have shifted with the rise and fall of nations and the evolution of new forms of transportation.

It is necessary first to define what is meant by *land value*. Land value may be defined as the value attributed to a location on the earth's surface, after all the value of the buildings or improvements on the site are deducted. Since buildings are reproducible, while the exact spot on the globe is unique, land value is finally derived by subtracting the cost of the buildings less depreciation from the combined land and building value. Land value is the capitalized value of the net income remaining after deducting from the joint land and build-


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ing income, the operating expenses, interest and depreciation on the cost of the building, real estate taxes and insurance. Sales prices of vacant land with prospective urban use are based on the capitalization of the net income which the buyer hopes to receive in the future, discounted for the waiting period.

The importance of studying land values is due to the enormous differences in the value of land from almost zero in the Sahara Desert to over $20 million an acre in Wall Street in New York City. The peaks of land value are but pinpoints on the earth's surface and yet they indicate the focal points of world finance, government and business headquarters.

There are no exact records of peak land values in Babylon, or Nineveh, or Memphis. We know that the Forum of Rome at the height of the Roman Empire had a value comparable to that of any modern center of commerce and finance, and that values in Venice, Antwerp, Lisbon and London also reached peak points when these cities became world commercial centers.

In 1790 the United States was an infant nation with 90 percent of its urban population living in cities on the Atlantic Seaboard. The peak value points were at the harbors where ocean ships loaded and unloaded their cargoes in Boston, Salem, New York, Philadelphia and Charleston. The resident population lived close to the port since, in the horse and wagon days, workers could not live farther than walking distance from central places of employment in factories and stores, which were also near the ports.

In the Colonial period and in the early nineteenth century there was little trade with the interior and land away from navigable streams leading to the Atlantic Ocean had practically no value. The plantation mansions of the South were on tidewater or on bayous leading to the ocean. Goods not produced in the vicinity were imported from Europe or shipped in by coastwise vessels.

It would be possible to construct a series of land value relief maps which would show range of land values by contours, such as relief maps of physical features show mountains, plateaus and valleys. If such a map were prepared, it would show for 1790 peak values rising like needles at a few ocean ports on the Atlantic Coast and then descending sharply within a few blocks to the far lower value for workers' homes. Agricultural values, which would still be much below the cheapest urban land value, would be highest along navigable streams and then fall off virtually to zero in the interior.

### *The River Towns*

The first shift in land value patterns in the United States came with the introduction of steamboats on the Mississippi valley river system and the rise of river cities in the period from 1820 to 1850. In this period the produce of farms located along the banks of streams flowing into the Mississippi and leading to New Orleans, the principal market, alone had an appreciable value. From 1820 to 1850 the population of Pittsburgh, Cincinnati, Louisville, St. Louis, and New Orleans increased from 50,000 to over 420,000. In this 30-year period the percentage of the urban population of the United States living in these five cities increased 7.2 percent to 18.4 percent, while the population of the Atlantic Coast cities, although growing rapidly, declined from 90 percent to 52 percent of the urban total. In addition to these larger river cities, there were numerous smaller settlements on rivers. Practically all of the cultivated crop land in the Middlewest bordered on streams leading

to the Mississippi or on canals completed or projected, leading to these streams. Land located at a distance from these waterways was not considered worth taking up—even at the government land office price of $1.25 an acre—because the cost of wagon transportation was 15 times as great as river freight.

The pattern of land values in the middlewestern river towns reached its peak at steamboat landings, and graded down sharply from that point. Thus Chicago, situated on the Chicago River near its mouth at Lake Michigan, had its first commercial district on South Water Street facing the river, and on Lake Street, the next street from the river. Land values dropped precipitously from these points.[1]

*The Railroad Towns*

The next great shift in land value patterns resulted from the building of a national railway network in the period 1850 to 1890. It opened up the interior and provided a market for agricultural products along the routes of railroads. The railroads also provided suburban transportation for large cities like New York and Chicago. During this period of rapid railroad expansion following the Civil War, cities were growing rapidly and, to meet the needs for living quarters for the increasing urban population in the larger cities, internal mass transportation was improved first with horse cars on fixed tracks, then with cable cars in the 1880's and finally electric surface lines, elevated lines and subways by 1900. The new mass transit lines created high ridges of land values in apartments and local shopping centers along their routes.

The railroads tended to shift the peak points of land value away from the ocean and river ports to the railway stations. In New York City, Wall Street in Lower Manhattan remained the center of finance but the retail and general office area moved northward toward the Pennsylvania and New York Central railway stations. Similar movements took place away from river fronts in Philadelphia, Chicago, St. Louis, New Orleans and other cities. However, the main focal point of peak values would be shifted only a few blocks, since the railroads sought to locate their own terminals as near as possible to the ocean ports or steamboat landings.

By 1910 the pattern of land values as determined by the transportation routes of railroads, cable cars, street cars, elevated lines and subways, had reached its most extreme form. Central business districts, the converging points of all mass transit routes, had achieved their highest level in proportion to land value in the remainder of the urban area. In Chicago the land value of the Loop, an area of less than 300 acres or less than one-quarter of one percent of the land in Chicago, was 40 percent of the total land value of the City of Chicago.[2]

A contour map of land values in American cities in 1910 would show the Himalaya mountain peaks of value in the central business districts, descending to plateaus of moderately high elevations in adjacent wholesale and high income residential areas and then falling sharply into low income residential areas on the edges of the concentrated mass.[3] In New York City there were two great peaks—Wall Street (the highest) and the retail center—but this was a unique pattern. In most cities the financial and retail areas were close together.

[1] For land value patterns in Chicago in 1836, see Homer Hoyt, *One Hundred Years of Land Values in Chicago* (Chicago, Illinois: University of Chicago Press, 1933), Fig. 73, p. 340; Table XLI, p. 345-6; Figs. 6, 7, pp. 34, 35.

[2] Hoyt, *op. cit.*, p. 337.

[3] *Ibid.*, for Chicago land value pattern in 1910, Fig. 32, Fig. 33, pp. 220, 221.

Richard M. Hurd, in his great classic, "Principles of City Land Values," gave examples of values of the best retail, best wholesale and best residence sites in twenty American cities as of 1911.[4] He cited the gradations in land value from farm land near cities, $50 to $150 an acre; market garden land $300 to $1,000 an acre; speculative tracts held at $500 to $5,000 an acre on the edge of cities.[5] He graded utilized urban lots, beginning at the lowest for mechanics' homes at $2.00-$4.00 a front foot, to $20-$30 a front foot for residences of small shopkeepers and clerks; to $40-$75 a front foot for more fashionable residences in cities of 75,000 population and under. In the larger cities the best residential sites sold from $75-$150 a front foot in cities of 100,000 to 200,000 population; $300-$500 a front foot in cities of 200,000 to 400,000 population; and in New York City from $2,000 to $5,000 a front foot on the side streets and $6,000 to $9,000 a front foot on Fifth Avenue for residential use.

Commercial land values were much higher than residential values in the same cities in 1910 and increased with the size of the city. As Mr. Hurd said:

"The poorest locations utilized for shops in the small cities are ordinarily worth $50 to $75 per front foot, from which point values rise to an average of $600 to $800 per front foot for the best business property in cities of 50,000 population; about $2,000 per front foot in cities of 200,000 population; $10,000 in cities of 2,000,000 population and $15,000 to $18,000 in New York."[6]

No one since Mr. Hurd has, to my knowledge, made a similar comparison of land values of different types of properties in American cities. He was able to gather this vast range of material as President of the Lawyers Mortgage Company of New York in the course of his mortgage lending experience in the cities of the United States. His book shows an extreme centralization of land values in American cities in 1910.

### *The Land Value Pattern of the Automobile Age*

The decentralization of land values began after World War I. The private automobile, while gaining rapidly in popularity, did not register an immediate effect on the land use or land value pattern in the decade of the 1920's. The internal mass transit lines, however, were extending the zones of settlement beyond the central areas and satellite residential towns were expanding around suburban railroad stations. High peaks of value were reached at commercial corners and at streetcar intersections in cities like Chicago, where outlying commercial districts with department stores, movie theatres, and branches of national chain variety and apparel stores were established. The greater proportion of the population still clung to the central city mass, however, where sewer and water lines were available. The high land value area was spread out over a greater distance in the central cities as the prosperity of the period enabled more and more families to live in higher-grade houses and apartments.[7]

It was after the New Deal, with its Federal Housing Adminstration financing, that the exodus began to suburban areas in the vacant zones between fixed transit lines. Widespread ownership of automobiles, hard surfaced roads, septic tanks and the power pump, coupled with planning of new subdivisions on large tracts, made it possible for families to move away from lands within walking

[4] Richard M. Hurd, *Principles of City Land Values* (New York, New York: The Record and Guide, 1924), reprint of 1911 edition, pp. 133-159.

[5] *Ibid.*, p. 133.

[6] *Op. cit.*, p. 142.

[7] Hoyt, *op. cit.*, Figure 42, p. 259, "Land Value Pattern Chicago: 1926"

distance of streetcar lines or suburban railroad stations.

Industry was the next to follow. Manufacturing could be carried on more economically in one-story plants. With all workers driving cars, and trucks taking over an increasing share of freight handling, it was no longer necessary to locate near downtown.

It was not until after 1946, the end of World War II, that the shopping center with ample free automobile parking sprang into existence on a large scale. Seventy great regional shopping centers duplicating downtown areas (with department stores, apparel and variety stores, as well as supermarkets, drug stores and a group of small service shops) on 50 to 100 acres of land, (and hundreds of smaller centers) were built in the last twelve years.

The latest pattern of land values that is being created by the automobile is spreading these values over a wider range. The new urban uses require much greater land areas. The row house could be built on a plot 14 x 50 feet, or 700 square feet, while the modern ranch house needs a frontage of at least 75 feet and a depth of 150 feet, or over 10,000 square feet. The retail stores in the older neighborhoods often covered every square inch of ground; the stores in the new suburban centers occupy not over one-fourth of the ground area, the balance being devoted to free parking. The new one-story factories are spread out over more land area than the old five- or six-story factory and the buildings occupy only a part of the ground area, the balance being devoted to parking for the workers' cars, storage and access roads. The Prudential office building in Houston is built on a 28-acre site, and the Prudential office building in Minneapolis and the Connecticut General building in Hartford are standing in the center of large parks.

In addition to greater space requirements for homes, stores, factories and offices, there are now more extensive land areas set aside for both elementary schools and high schools. Branches of universities now acquire as much as 150 to 500 acres. Many suburban churches now have large parking areas. Airports are demanding ever greater land areas. The older airports such as Midway in Chicago and LaGuardia in New York, with one square mile or less, are being superseded by airports large enough for the longer runways required by the jet airplanes. The newest airports—Idlewild in New York, O'Hare in Chicago and Dulles in Washington, D. C.—absorb ten square miles of land. There is a great increase in the number of golf courses, which require 150 acres or more for an 18-hole course. A 32-lane bowling alley requires five or six acres of ground in order to allow for parking of patrons' automobiles.

New six- and eight-lane divided expressways not only absorb far more land on their routes than the old two- or three-lane roads but the traffic interchanges require a substantial land area. Even in the center of cities, redevelopment plans provide for open spaces and parks between the tall buildings. After the dense "canyons" of Wall Street led to the New York zoning law requiring building setbacks, it was found that the plazas in Rockefeller Center paid dividends in the form of higher rents for the offices. In the Golden Triangle of Pittsburgh and Penn Square in Philadelphia the office buildings are in the midst of plazas and parks. Plans for redevelopment of Bunker Hill and the Temple Project in Los Angeles, and redevelopment plans in most other cities

call for open areas and plazas between the buildings.

This opening up and spreading out of the urban land use pattern was made possible by the automobile, which brought great tracts of land on the periphery of metropolitan areas within driving-time distance of places of employment. Industries, shopping centers, schools, churches and even office buildings were also located out toward the new residential areas, thereby reducing still further the driving time between home and office or shop.

Not merely has the motor age extended the periphery of the metropolitan areas and filled in the spaces between the mass transit lines but it has vastly extended the radius of week-end and vacation travel. The piston airplane brought Miami Beach and other Florida resorts within a few hours' travel time from the heavily populated eastern half of the United States and established Nassau, Montego Bay in Jamaica, San Juan in Puerto Rico and Acapulco in Mexico as popular winter resort areas, and it vastly accelerated travel to Europe, Hawaii and the Orient. The jet-powered planes will extend the radius of travel for short vacation periods still further—to South America, islands in the South Pacific, to Africa and Asia.

The newest land value pattern reveals a lowering of old central land value peaks and a subsidence of old-style retail peaks at streetcar intersections, and a rise in values of farm lands on the edge of cities as they come into urban use. New peaks of value have risen in regional shopping centers, near expressway interchanges or on vacant tracts in between suburban settlements. New peaks of value have risen in the tall hotels, motels and apartments on the ocean front from Miami to Palm Beach. The old amusement parks in many cities have been torn down, to be replaced by a Disneyland, south of Los Angeles, with all of its attractions on 65 acres and 100 acres more for parking.

A new agricultural pattern has also supplanted the old farm pattern as a result of the new forms of transportation. Market garden lands within wagon-haul distance of the cities had a relatively high value in 1910. Now, with refrigerated freight cars and trucks, California, Texas, Arizona and Florida supply fresh vegetables in the winter; and frozen foods and concentrates in supermarkets have still further enlarged the market. Many farmers no longer live on rural farmsteads, but in towns or cities, coming to the farm for short periods only to plant or harvest with tractors and harvesting machinery. There are migrating farmers, who plant and harvest crops in Florida in the winter and in the North in the summer. Farm lands once remote from fixed transportation routes have gained in value because of truck transportation and also because of government price supports. The modern pattern of agricultural and urban land values is a far cry from that set forth by Von Thunen in "Der Isolerte Stat" in which land values graded down from the center to garden lands surrounding the city, and then to cereal lands and grazing lands at greater distances.

While peaks of land value are thus being established at new points on the earth's surface, it must be emphasized that the area of these new peaks is extremely limited and the land area occupied by them is only a microscopic fraction of the land area of the United States.

Even in the old central cities, the celebrated peaks of value so often cited—Wall Street or Fifth Avenue in New York, State Street in Chicago—extended over only a few acres. The Chicago

Loop embraces only about 250 acres. The heart of the Manhattan high value area from 34th to 59th Street, from Fourth to Eighth Avenues and the Wall Street area, would not embrace more than 500 acres. In this area is the greatest concentration of tall office buildings in the world. Manhattan is a world center of commerce and finance.

I have calculated the areas of the Central Business Districts as furnished to the 1954 Census of Business, which in most cases included fringe areas outside the central core. As the following tabulation shows, there were 30,460 acres in Standard Metropolitan Areas with an estimated population of 82,000,000 in 1960. Allowing for other urban areas with an estimated population of 40,000,000 at the rate of 2,500 persons per acre, there would be a total of 46,460 acres or 73 square miles in all the Central Business Districts in the United States in 1960. This would be equivalent to one-third of the land area in the city limits of Chicago, or one-fifth of one percent of the estimated urban area of 39,000 square miles in the United States. In the central cities of 168 Standard Metropolitan Areas there are 5,772 square miles. The 30,460 acres or 48 square miles in the Central Business Districts of these Standard Metropolitan Areas would be less than one percent of the central city areas.

However, the areas listed as Central Business Districts in the 1954 Census of Retail Business cover a much greater area than the high value peak areas. Thus, in Kansas City, Missouri, 37 acres would cover the heart of the retail area, out of a total of 220 acres listed in the C.B.D. In San Diego there are only 24 acres in the high value retail zone.[8]

[8] Homer Hoyt Associates, *Economic Survey of San Diego Downtown Area*, March 1958, p. 8.

NUMBER OF ACRES IN CENTRAL BUSINESS DISTRICTS OF UNITED STATES CITIES: 1960

| Population Size Metropolitan area | Area in C.B.D. (acres) | Population per Acre | Estimated Population 1960 |
|---|---|---|---|
| Over 5,000,000 (New York, Chicago, Los Angeles) | 3,382 | 8,280 | 28,000,000 |
| 1,000,000 to 4,999,000 (14 S.M.A.'s) | 11,089 | 2,525 | 28,000,000 |
| 500,000 to 999,000 (13 S.M.A.'s) | 7,637 | 1,833 | 14,000,000 |
| 250,000 to 499,000 (32 S.M.A.'s) | 8,352 | 1,437 | 12,000,000 |
| TOTAL S.M.A.'s | 30,460 | 2,692 | 82,000,000 |
| *All Other Urban Areas* | 16,000 | 2,500 | 40,000,000 |
| TOTAL | 46,460 | 2,625 | 122,000,000 |

In the new pattern of land values the high value peak areas are similarly limited. The 70 new regional shopping centers built since 1948, with an estimated 80 acres per center, would cover 5,600 acres of ground area or only 8.8 square miles. An estimated 200 community shopping centers with 40 acres each would have absorbed 8,000 acres or 12.5 square miles. An estimated 2,000 neighborhood shopping centers with 10 acres each would have absorbed 20,000 acres, or 31 square miles. Thus, even with the buildings occupying only one-fourth of the ground area, not over 33,600 acres or 52.5 square miles have been absorbed by the new type shopping centers. Small as this amount is, expressed in terms of percentage of the total urban area, it still is as great as the total area covered by Central Business Districts of our 168 Standard Metropolitan Areas. In many cases a single regional shopping center, with three-fourths of the land devoted to parking and with most of its buildings on one level, occupies more land than the Central Business District of the same city,

which is crowded with tall buildings covering most of the land area.

The peak value sites of recreation lands are also confined to very limited areas. In Florida the highest prices are paid for lands along the Atlantic Ocean in the 66 miles between Miami and Palm Beach where the Gulf Stream flows offshore. A strip of land along the ocean 66 miles long by 400 feet deep would amount to only 5 square miles. The entire coast of Florida—1,200 miles long to a depth of 400 feet—would cover a total of 90 square miles or only one-sixth of one percent of the 54,262 square miles in the land area of Florida.

The area covered with high-priced homes is similarly only a small fraction of the total area of a city. High residential land value is now spread over a greater area than in 1910 when land on Fifth Avenue in New York City sold for $9,000 a front foot. Still $79,000 has recently been paid for an acre lot in the Doheny Estates in Los Angeles, and prices of several hundred thousand dollars have been paid for lots in River Oaks in Houston. Such extremely high land values are limited to the choicest areas of a few cities.

### *Nucleation of Complementary Uses*

In the new urban land pattern which is taking shape, greater emphasis is placed on uses that complement and supplement each other. Formerly each parcel of land was valued separately and was an independent entity, depending of course to some extent on the character of the neighborhood and its relation to other uses. In the majority of cases this old pattern of values still prevails and will continue for a long time.

However, the new type of shopping center must be valued as an integrated whole, and not by separate parcels. The parking area yields no revenue at all, but without it the stores would have no value. The large department store, the chief magnet of the center, pays only a break-even rent, and sometimes has been given the site, and yet without it profitable leases could not be obtained from the specialty apparel stores. Hence the center must be valued in its entirety. Similarly, a golf course and a country club, whether profitable in itself or not, is necessary to establish a high-grade character for a community.

There are other types of integrated suburban communities which are being planned for the future in which industries in parklike settings, shopping centers, schools, churches and recreation areas will all be built in one large area, which will have main traffic arteries encircling it but not cutting through it. Such communities will have their own water supply and sewage disposal system. Here the value of each use would be enhanced by each other use. The industrial area would have higher value because of proximity to homes of employees and the residences would be worth more because of the short distance between home and work.

This pattern of complementary uses is now being created in central redevelopment areas. At Bunker Hill in Los Angeles a total of 131 acres will be cleared of existing structures and office buildings, apartments, garages, hotels, motels, an auditorium, and small shops will be built in parklike settings with a complete separation of automobile and pedestrian traffic. Here executives of firms in the office buildings can live within walking distance of their work and all will have ample parking facilities. A new headquarters center is thus created which will have a different value from any separate parcel in the old Central Business District.

In all these new types of development, however, land values will never reach the

old peaks that were attained in Wall Street or Fifth Avenue in New York, State Street in downtown Chicago, or Market Street in Philadelphia. The automobile has given a far greater flexibility in the choice of sites and has taken away the monopoly value of sites at the converging points of mass transportation. The Central Business Districts will still retain a high value but the prospect of further gains in their land values in dollars of current purchasing power is doubtful.

In the older residential areas of the city the land and building value are almost indissolubly joined. The entire property has a value based on rental income from the existing structure, whose value as a building may increase with a rise in construction cost of new buildings and thereby the rise in replacement value more than offsets depreciation and obsolescence. The land itself has a value only if it can be devoted to a higher and better use, such as replacement of a house by an apartment building, which will absorb the cost of the structure on the land. In many old areas, a small lot has its chief value only in the assembling of a tract large enough to form a completely new neighborhood. The plottage value gained by the assembly, however, is usually more than offset by the cost of paying for structures which are to be wrecked but still have to be paid for because they are yielding an income. Usually a federal and local subsidy is required to make up the difference between the acquisition cost and the re-use value.

Land values in the future will be created to a greater extent by the developer who builds a new type of community such as Levittown in Pennsylvania, or develops a new regional shopping center at a highway interchange, or constructs a new industrial park. Here again the opportunities are limited to a few locations. The very building of one huge regional shopping center inhibits the location of a second in the same region. The promoter who gets there "first with the most" may create the land value but thereby may prevent the same value from being created nearby.

In prior decades the land speculator could buy land on the edge of the built-up area and wait for the mass extension of sewer and water lines and homes to engulf his land. This has been the pattern of the period since World War II. However, in the future, developers of entire new communities may jump over close-in tracts and go to areas where land is cheaper, as the Sampson Development Company has done in the Pittsburgh metropolitan area.

Thus the recent dynamic factors in land values, due chiefly to new transportation media, have caused profound changes in the old land value patterns and changed calculations based on the continuation of former trends. Emergence of new peak points of land values has afforded the greatest opportunity for capital gains, and also created the greatest risks and hazards, because the location of the new peaks is no longer determined by former standards.

# An Analysis of the Italian Agrarian Reform

*By* LORENZO M. BELOTTI*

ARTICLE 44 of the 1948 Italian Constitution states that, in order to secure rational utilization of the soil and to establish equitable social relationships, the law imposes obligations and limitations on private ownership of land, sets limits according to regions and agricultural zones, promotes and imposes land reclamation, the transformation of large estates and the reconstitution of productive units.[1]

With the above constitutional provision as background, the government formed by Alcide de Gasperi after the election of 1948, presented to Parliament a general land reform scheme. The scheme provided for the expropriation of land from persons, corporations, or other organizations owning more than a certain amount (300 to 500 hectares, depending upon various factors) for payment of the expropriated land in goverment bonds, and for distribution of the land to landless peasants. The plan, as it was originally conceived, was bitterly fought by the Italian political right. They maintained it was going too far. It was fought by the landowners who were opposed to any kind of reforms, and it was also opposed by many members of the ruling Christian Democratic Party, which considered the plan impracticable at the time and likely to have disastrous effects on agricultural production.

While the general land reform project was discussed and debated, unrest among the peasant classes was mounting. Land was promised to the peasants during the elections of 1948 and they demanded that land be given to them quickly. At the same time, Communist propaganda and propagators instigated the peasants to action, and action came. During the first month of 1950 at Melissa, in the Calabria region, crowds of wretched, miserable peasants, after having arbitrarily occupied private lands, refused to leave them and opened fire on the police. The resulting battle ended with a few deaths, and many wounded, also other illegal occupations of lands, and an arousal of public opinion. Parliament, confronted with an increasingly difficult situation, decided that prompt action of some kind was essential and, after a few days of debate, on May 12, 1950, passed a law designed to carry out the colonization of the Sila high lands where peasant dissatisfaction was most pronounced.

Contact with such a localized measure of reform directed the attention of the legislators to similar depressed zones, characterized mainly by that socio-economic structure called *latifondo*.[2] Thus a decision was reached in Parliament to attack first this most urgent part of the general reform. The law which was passed was named *Stralcio*, or partial reform law, and its application was limited to the expropriation of lands in those zones where large landholdings, extensive cultivation, overpopulation, and large though disguised unemployment were prevalent.[3]

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[1] According to Article 846 of the Italian Civil Code, by "productive unit" is meant the area of land necessary and sufficient to provide full employment to the farmer and his family, or sufficient to carry on a convenient cultivation according to good agricultural techniques.

[2] The latifondo is characterized by the almost total absence of capital investment in buildings, irrigation, plantations; by an extensive and discontinuous cultivation of cereals alternated with grazing; by a farm population residing far away from the towns; and by absentee ownership. Friedrich Vöcting, "La Riforma Fondiaria in Italia," Studi Economici, January-June, 1956, p. 52.

[3] Ministero dell'Agricoltura e delle Foreste, *Le Leggi di Riforma Fondiaria* (Rome, Italy: Istituto Poligrofico dello Stato, 1953), pp. 19-35.

The most important provisions of the Italian land reform measures (Stralcio law) can be summarized as follows:[4]

1. The creation of "comprensori di riforma," or areas of reform, consisting of large tracts of land each of which was administered by a public agency, or Ente di Riforma, operating under the direct supervision of the Ministry of Agriculture.
2. The newly created agencies were required to prepare expropriation plans, to make the necessary improvements to the soil, to provide for the construction of buildings, to undertake irrigation and reclamation projects, and to redistribute the expropriated lands to peasants. The Ente was also charged with the responsibility of providing technical assistance to the assignees, of promoting and organizing free vocational courses, of maintaining mechanical training centers, and of encouraging various other activities connected with agriculture.
3. The amount of land to be expropriated in each zone was to be arrived at by applying a formula which would take into consideration the income of the land as a whole and the average income per hectare.[5] Property owners were allowed to retain one third of the expropriable portion, up to a limit of 300 hectares, on the condition that they undertake to develop it in accordance with the prearranged plans of the agency.[6] Also, excluded from expropriation, according to Articles 10, 11, and 12 of the Stralcio law, were model farms—farms well organized, efficient, and run in cooperation with the workers—for a total area not to exceed 500 hectares.[7]
4. Compensation to landowners was to be based on the taxable value of the expropriated lands assessed in accordance with the progressive tax on wealth, instituted in March 1947, and it was to be paid in 5% state bonds redeemable in 25 years.[8]
5. The expropriated lands were to be transformed and assigned, within three years of the expropriation date, to landless peasants or tenants of tiny holdings whose land was totally insufficient to support a family. At the time of the assignment a purchase contract between the peasant and the Ente was to be signed. In it the assignees agreed to pay the value of the land in thirty yearly installments, title being retained by the agency until the contract price was paid in full.[9] During the thirty-year period the assignee had to agree not to sell, rent, lease or divide the property assigned to him, and to join for a period of twenty years the various cooperatives promoted by the Ente. In case the peasant did not fulfill his obligations the land was to revert back to the Ente to be reassigned.[10]
6. The territories subject to this first section of the reform were the following:[11] the Po Delta in northern Italy, the Tuscan Maremma and the Fucino Basin in central Italy, the Sila high lands, part of Campania, and the regions of Apulia, Lucania, Molise in southern Italy, and the whole area of Sardinia island. (Land reform legislation in Sicily is under the jurisdiction of the island's governing body.)

With presidential decrees, on November 7, 1951, territorial boundaries were

[4] *Ibid., passim.*

[5] In other words, the percentage of land to be expropriated was inversely proportional to the potential income per hectare for each class of total income. This method, though extremely complicated, avoided the pitfalls of the two simplest criteria—expropriation based on either acreage or total income alone. The acreage standard would have left out of court such factors as yield and investment in the land, while expropriation on the basis of income might have left untouched large areas of land with a low yield, such as the typical latifundia. A table showing percentages of expropriation was incorporated in the law. (Ministero Agricoltura e Foreste, *op. cit.*, fn. 33.)

[6] Subsequently, half the retained land was to be allotted to peasants by the agency and the other half was to remain the property of the landowners.

[7] To qualify for this exemption the average production of the farm was to be 40 percent greater than the average yield obtained in the region in the last five years and the economic and social conditions of the laborers were to be markedly superior to the standards encountered in the area.

[8] Ministero Agricoltura e Foreste, *op. cit.*, p. 26.

[9] The price paid by the peasant never exceeds two-thirds of the cost of transformation undertaken by the agency (less government contributions), plus the expropriation indemnity paid to the former owners. The price is furthermore calculated upon the productivity of the new farms, taking into account the necessity of allowing the peasant families the conditions required for a tolerable life and the possibility of a minimum of savings. (Ente per lo Sviluppo dell'Irrigazione e la Trasformazione Fondiaria in Puglia e Lucania, *Land Reform in Southern Italy* (Bari, Italy: Ente Sviluppo Puglia e Lucania, 1956), p. 10.

[10] Ministero dell'Agricoltura e della Foreste, *op. cit.*, pp. 12-13.

[11] See Table I, for the total area, the area subject to reform and the expropriated area.

ITALY
ALTO ADIGE
FRIULI
VENETO
TURIN
PIEDMONT
MILAN
LOMBARDY
VENICE
TRIESTE
PO DELTA
EMILIA
LIGURIA
GENOA
BOLOGNA
TUSCANY
FLORENCE
MARCHES
UMBRIA
ABRUZZI E MOLISE
PESCARA
LATIUM
ROME
TUCINO
NAPLES
CAMPANIA
APULIA
BARI
LUCANIA
CALABRIA
SARDINIA
CAGLIARI
PALERMO
SICILY
CATANIA
0 50 100 150
KM
REFORM ZONES

established, administrative agencies for each territory were set up, and the reform got under way.

Many and difficult were the problems encountered by the reform agencies as they initiated their work. Large portions of the reform areas consisted of rough woodland, of marshy land full of stagnant pools, of eroded and impoverished soil. Before the land could be expropriated, plans had to be drawn up; before rational farming could be possible vast works of drainage, leveling, road making, and deep ploughing had to be undertaken; before the land could be distributed to the new peasants, farm buildings and farm dwellings had to be provided. It was a gigantic task for the Italian government to carry out. But, once the reform got under way, it proceeded at a remarkably fast pace. In a few laborious years low-lying lands were drained, artesian wells sunk, aqueducts constructed, rivers and torrents brought under control, lands leveled and ploughed. By the end of 1956, 800,000 hectares of land were expropriated, over 4300 tractors and 40,000 pieces of agricultural machinery were introduced, 4500 miles of roads were completed, 50,000 heads of cattle were distributed, and 587,000 hectares of land were assigned to the new peasants.[12]

TABLE I—Italy's Land Reform Zones, Their Total Area, Area Subject to Reform, and Expropriated Area
(*Hectares*)

| Zone | Total Area | Area Subject to Reform | Expropriated Area |
|---|---|---|---|
| Po Delta | 260,000 | 47,500 | 44,200 |
| Tuscan Maremma | 956,638 | 179,700 | 177,500 |
| Fucino Basin | 44,160 | 18,000 | 15,900 |
| Campania (Volturno-Sele) | 121,431 | 16,700 | 8,300 |
| Apulia-Lucania-Molise | 1,453,181 | 199,000 | 189,400 |
| Sila Region (Calabria) | 545,379 | 90,100 | 74,800 |
| Sardinia | 2,321,645 | 104,000 | 49,900 |
| Sicily | 2,439,224 | 145,000 | 140,000 |
| Total | 8,141,658[1] | 800,000 | 700,000[2] |

*Source: Agricola* (pseudonymous), "Primo Bilancio della Riforma Agraria," *Mondo Economico*, December 1, 1956, p. 14; and A. Serpieri, "Riforma Agraria in Italia," *Economia Internazionale*, November, 1954, p. 733.

[1] The total area of the zones listed above, 8,141,658 hectares, represents 30% of the total agricultural land of the country and about 50% of the total arable land. The expropriated area is approximately 8.8% of the total area.

[2] The difference of 100,000 hectares between the total area subject to reform and the expropriated area is represented by land already in possession of the State (48,400 hectares) and of the Ente for the colonization of Sardinia (51,600 hectares).

The expropriated lands were subdivided into small independent agricultural units (poderi) capable of providing a livelihood for the farmer's family. Each peasant family was settled in a home built on his own piece of land. Each dwelling was provided with a good size living room, a kitchen, two bedrooms, a store room, an indoor lavatory with tub or shower. Built in proximity of each house was a stall for three to four animals, a pigsty, a hen house, and a

[12] Esposto Attilo, "Le Funzioni degli Enti di Riforma," *Politica ed Economia*, December 1957, pp. 5-7.

small silo.[13] By December 31, 1946, 553,779 hectares of expropriated land had been assigned to 104,407 peasant families, the size of each parcel assigned varying in relation to the quality and location of the land.[14]

TABLE II—Distribution of Expropriated Lands
*(As of December 31 of each year)*

| Year | Assignees[1] | Area in Hectares | Average in Hectares[2] |
|---|---|---|---|
| 1953..... | 60,754 | 311,234 | 5.12 |
| 1954..... | 89,880 | 473,685 | 5.27 |
| 1955..... | 99,357 | 526,116 | 5.30 |
| 1956..... | 104,417 | 553,779 | 5.30 |

[1] It is estimated that the assignees will reach ultimately an approximate number of 130,000 and the total population affected will be approximately 600,000 persons.

[2] The figures in this column are somewhat misleading because of the fact that in the Fucino Basin, in the Tuscan Maremma, in the Sila region and in the Apulia-Lucania reform zones compensating quotas of about 2 hectares in size representing a total area of 109,029 hectares, were distributed to assignees which already possessed some land. Taking this fact into consideration, the average new family holding is about 7.40 hectares.

*Source:* Istituto Centrale Statistica, *Annuario Statistico Italiano, 1957*, p. 178.

Expropriation, transformation, and distribution of land represented only one of the tasks to be performed. Many other problems were to be solved. To enable the new settlers to engage in spiritual, educational, commercial, social, and recreational activities, the reform agencies established rural centers (borghi rurali). Each center was provided with church, vicarage, grade school, shops, stores, meeting halls, post office, medical clinic, police station and in some cases a theater and playfields.[15] A total of 67 centers were completed by September 1957 and each one of them served an area of approximately 300-400 hectares with an average population of about 1000. For the immediate needs of the new owners the agencies also constructed service centers, each serving groups of farms in an area of about 1000 hectares and each including houses for the technical staff and their families, club room, small clinic, a store and a few shops.

As soon as the new assignees took possession of their new places, the reform agencies conducted a program of agricultural development based upon the improvement of traditional crops, the introduction of new crops (especially commercial crops), and the improvement and expansion of livestock production. To assure a constant improvement of the soil the agencies intensified everywhere the use of organic and chemical fertilizers, the cleansing of the soil, and the use of recuperative crops. To improve the livestock different breeds of cattle were imported in the reform zones and veterinary clinics were set up. To teach the new farmer-owners the use of modern farming techniques, experimental farms, staffed with experienced personnel, were established in all reform zones.[16]

Next the agencies devoted their attentions to develop cooperation among the assignees. Cooperation among them, it was felt was vital to their survival. A landed peasantry with small holdings, small or nonexistent capital resources, and no credit at the bank may be able for a time to obtain a bare subsistence from the land but, as has been demon-

[13] Ente per la Colonizzazione del Delta Padano, *Colonizzazione, Trasformazione Fondiaria ed Edilizia Rurale nel Comprensorio di Riforma* (Bologna, Italy: Officine Grafiche Calderini, 1958), p. 13.

[14] Istituto Centrale di Statistica, *Annuario Statistico Italiano* (Rome, Italy: Istituto Poligrafico dello Stato, 1957), p. 178. See Table II for number of holdings and their average size.

[15] The creation of rural centers, one of the few experiments of the kind ever undertaken, is probably one of the most important features of the Italian land reform scheme. From a psychological and social point of view, these centers greatly help the peasants to adjust to their new situation and environment. Moreover, the provision of educational facilities will make it possible for many of the peasants' sons to leave the land and engage in other activities.

[16] See Esposto Attilo, *loc. cit.*, pp. 5-8; Ente per la Colonizzazione del Delta Padano, *op. cit., passim:* Ente per la Sviluppo dell'Irrigazione e le Trasformazione Fondiara, in Puglia e Lucania, *op. cit., passim*, and Ente Maremmia *Land Reform in Maremma* (Rome, Italy: Ente Maremma, 1955), *passim*.

strated many times,[17] such small holdings, if not accompanied by a large degree of cooperation among their owners, lead the peasants to utter misery until they are forced to give up what little land they have. To avoid such a sad happening, the agencies devoted much time and effort to promote the formation of cooperative societies. After a very slow beginning, during which the future members were instructed in the management and economics of cooperatives and were prepared to assume the responsibility of cooperation, the reform agencies succeeded in establishing over 500 cooperatives (end of 1956) with a total membership of 47,000 families. These cooperatives provide, among their various services, the purchase and distribution of seeds, fertilizers, agricultural tools and implements. They run tractor stations, stores and shops. They perform the collective sale of fruits, vegetables and dairy products. They transform and process grape into wine, olives into oil, milk into cheese. They assist the members with their technical and financial problems and will eventually take over many of the functions which are now being performed by the government agencies.

In the field of professional instruction, the Ente, on its own initiative or in cooperation with the Ministry of Education, organized and conducted courses in agricultural mechanics, in arboriculture and herbaceous cultivation, in the preparation of the soil, in farm management, livestock breeding and other courses frequented by over 50,000 assignees and their sons. For the women, special courses in personal and domestic hygiene, sewing, domestic and rural economy were also organized. Furthermore, a large group of sons of assignees have been sent every year to agricultural training schools in northern Italy.

Finally, to help the assignees overcome the numerous fears, superstitions, and prejudices which centuries of miserable living have created in them and to make it easy for them to adjust to the new situation, the agencies brought social workers into the reform zones. Each rural center was given at least one social worker and each 100-200 families were assigned a social assistant.[18]

The transition (from private administration of the land to its direct administration by the agencies after expropriation and subsequent distribution to the peasants) took place, contrary to what is generally assumed, without any disruptions which might have prejudiced production. The resettlement of peasant families from the overcrowded towns to the countryside has proved to be most suitable and most agreeable to the peasants themselves.[19] Moreover, the introduction of improved techniques, the employment of mechanical equipment, a larger use of fertilizers, a more rational rotation of crops and an improved breeding of livestock made possible a notable increase in production. For example, in nineteen different areas of the Tuscan Maremma in central Italy, the unit yield of wheat rose from 13.3 quintals per hectare before the reform to 19.5 quintals after the reform. The number of olive trees increased from 35 thousand in 1951

[17] See the experiences of Haiti and Mexico as described by Earl Parker Hanson in *Transformation: the Story of Modern Puerto Rico* (New York: Simon & Schuster, 1955), pp. 245 ff.

[18] By the end of September 1957, the various Ente in charge of the land reform had completed 67 rural centers, 174 service centers, 22,603 rural dwellings, 166 schools, over 5,000 kilometers of country roads, over 600 irrigation and other hydraulic works, and 467 electric installations; they had formed 543 cooperatives of various kinds with over 47,000 members; and they had established 1,873 courses in agriculture and in other fields frequented by over 55,000 students. (See, Comitatato Interministeriale Ricostruzione, *op. cit.*, p. 126, Table 24, and Esposto Attilo, *loc. cit.*, pp. 8-9.

[19] It has always been believed that the peasants would oppose being moved from their town homes and especially the women who have spent all their lives in the crowded but friendly proximity of the towns. See Margaret Carlyle, *op. cit.*, p. 136.

to over 90 thousand in 1954; that of grape vines from 340 thousand to over one million. The average density of cattle per hectare passed from 0.80 to 1.80 quintals live weight. On the basis of such results, the increase in the value of marketable production for that part of the Tuscan Maremma under reform was estimated at 9.5 billion lire, or an average increase of 60-70 thousand lire per hectare above the pre-reform days.[20]

To carry out the provisions of the reform laws the Italian Parliament appropriated at various times the total sum of 634 billion lire (about 1 billion United States dollars).[21] Total expenditures were estimated as follows:[22]

| | Total Cost (*billions of lire*) | Cost per Hectare (*lire*) |
|---|---|---|
| Land transformation | 500 | 625,000 |
| Colonization works | 97 | 121,250 |
| Organization of co-ops | 10 | 12,500 |
| Agricultural industries | 18 | 22,500 |
| Totals | 625 | 781,250 |

The largest amount of the total expenditures, as the above figures show, is absorbed by the cost of land transformation and reclamation, which includes the reclamation of lands, the preparation of the soil, the introduction of new crops (especially arboreous), the building of installations for irrigation, the construction of farm buildings, the acquisition, from the part of Ente, of livestock, fertilizers, seeds and agricultural machinery to be distributed to the new peasant-owners.

The second largest group of expenditures (about one fifth of the total) is taken up by colonization works which comprise all those works (rural villages, service centers, service buildings, connecting roads, electric lines, water lines, sewage works and social services) necessary to provide the so called "infrastructure" upon which much of the success of the reform is based.[23]

The remainder of the cost of the reform is made up of expenditures related to the formation of cooperatives among the new owners and the creation of agricolo-manufacturing industries for the transformation and processing of wine, milk, olive oil, sugar beets and other agricultural products. Plans have been drawn for the construction, in the first ten years of the reform, of 100 milk plants, fifty wineries, and twenty oil mills.[24] All in all, when the reform is completed, the organic settlement of each agricultural unit will have cost on the average about 7-8 million lire.

What is the result—the yield in purely economic terms of this gigantic expenditure of capital? It is as yet too early to make any precise statements in this regard. Data from the Ministry of Agriculture show a capital yield for the year 1955-56 of about 5 percent.[25] Considering, however, the good results obtained in those territories where the reform is in its advanced stage, the capital yield is expected to reach at the end of the reform a rate of 7 to 8 percent.[26]

Can such an expenditure be justified in a country where industrial production is still very low, where industrial investment has shown itself capable of produc-

[20] Ente Maremma, *op. cit.*, p. 39.

[21] 384 billion lire were appropriated in 1950 according to the Sila and Stralcio laws, and 250 billion in 1957 according to the new law regulating the reform agencies, July 9, 1957, n. 600.

[22] Agricola, (pseudonymous) "Primo Bilancio della Riforma Agraria," *Mondo Economico*, December 1, 1956, p. 17.

[23] The Italian Fund for the Development of the South is contributing 280 billion lire for colonization and other works.

[24] Agricola, (pseudonymous) *loc. cit.*, p. 16.

[25] *Ibid.*, p. 17. It is calculated that at the completion of the reform the value of the total production from the 800,000 hectares comprising the reform will reach a total of 80 billion lire, that is an increase of 50 billion lire over the pre-reform value. Pietro Germani, "Italy's Postwar Agriculture," Banco di Roma, *Ten Years of Italian Economy* (Rome, Italy: Banco di Roma, 1957) p. 40.

[26] *Ibid.*, p. 17.

ing much greater returns, and where capital is in short supply? The answer to this question cannot be arrived at in a simple way. It involves an analysis of all the arguments which lately have been posited in much of the literature on economic development, and it relates especially to that unending controversy based on what type of development should come first: industrial development or agricultural development.

If one investigates, even superficially, the economic and social structure of Italy, he must come to the conclusion that what the Italian government has done and is doing to increase agricultural production is justified. For a country like Italy whose economic structure (the existing relationship between men, reresources, and techniques) presents a marked imbalance, whose institutions are still much imbedded in medieval thinking, and whose population has been until recently mostly devoted to agricultural pursuits, the creation of a good agricultural base is almost a must for future sustained economic growth.

The agrarian reform in Italy is important also in many other respects. The newly formed holdings of the settlers are situated in the midst of other areas not directly subjected to the control of the Ente and thus they are like little isalnds of development or, using more sophisticated terms, they are "energetic poles" of development whose progress is bound naturally to contribute to the process of economic expansion of the entire reform regions.

From the point of view of the labor market, the agrarian reform represents a great work of social reclamation. Transformation works have made possible a permanent increase in employment, not so much because of the increase in the number of workers as for the increase in the number of days worked by the existing workers. It is estimated that the reform zones will provide permanent full employment for 250-280 thousand workers previously unemployed.[27] The benefits of a more intensive economic life which is being brought about by increases in employment and production have and will continue to have great repercussion in the development of the South where most of the reform zones are located.

From the point of view of the Italian economy as a whole, the agrarian reform has given work to hundreds of thousands of unemployed workers. It has increased tremendously the demand for building materials, furnishings, tractors, agricultural machinery and the like, thus increasing industrial employment all over Italy. It has increased the demand for consumers goods, thus helping to create a larger home market. It has shown people that it is possible to achieve democratically what they expected to achieve by totalitarian means and this has strengthened a young and weak democracy.[28]

The agrarian reform in Italy represents also a great social experiment. Masses of peasants that till now have been living at the very edge of civilization, that possessed but the very rudimental art of cultivating the land, whose experiences have been limited to the raising of wheat and the grazing of sheep and goats, who, for the most part, could not write or read, whose atavistic teaching made it very

[27] Agricola, (pseudonymous) *loc. cit.*, p. 16.

[28] What the reform has accomplished in this respect can be illustrated by the case of a farmer in the Metaponto area. This man was a landless day-laborer, a leading local communist in 1950. In the Spring of 1955 he was proud to take visitors around his holding. He had sown wheat, planned various kinds of fruit trees, some vines, a fodder crop and a variety of vegetables which he sold several times a week to the Toronto market. He is now an ardent Christian Democrat. (Margaret Carlyle, *op. cit.*, p. 135) This poor peasant's story, and many others that could be recited, shows once again that Communism in Italy, and for that matter in many parts of the world, gained its strength because of poverty, unemployment, and social injustices.

difficult for them to accept new methods,[29] were removed from their environment, were taught a new way of life, new methods of doing things, were given a piece of land and a home, and were set free to find a new purpose in living. The experiment is still only in its early stages but there is a great feeling of vitality in the reform zones and in the country surrounding them. There is hope, there is work, and there is the fact that something has been achieved in six or seven years whereas in the past no appreciable improvement had been made in the peasants' lot in as many centuries.

Mistakes, of course, have been made and criticisms have continued in an endless flow since the reform laws were approved. There have been many complaints against the Ente because it has been moving too slowly in promoting the formation of cooperatives without which the new holdings cannot live and prosper; because the paternalistic approach of the government technicians is a hindrance to the development of a small farm mentality; because the new farmer-owners are forced to take over cattle for which they have to pay but they are not allowed any choice in their selection, and the like.[30] Against these criticisms many things can be said in defense of the Ente. The officials in charge of the reform well understood the importance of cooperation but they have equally well understood that the new peasants were not prepared for it: They have therefore moved carefully. Increasing levels of education together with increased experience and the good results obtained from the established cooperatives will make this task easier to carry out in the future. Moreover, while there may be cases where the officials are anxious to see the farms running well without being concerned about the creation of a farmer's mentality, "many of the officials are possessed by the finest ideals of the reformers and are working to make the farmers who come under their special care able to do without them as soon as possible."[31] Professor Rossi-Doria, student and acute observer of the reform, stated that perhaps one of the most important developments of the reform is the new relation between peasants and officials. "For the first time," he wrote, "the Calabrian peasants find young technicians alongside of them every day as fellow workers, counselors and friends."[32]

Among other criticisms, possibly the most serious is the one directed against the formation of innumerable small farm holdings. Are these new holdings, ask many new students of the reform, sufficiently large to provide the new peasant families with a normal and increasing standard of living? Are they set up according to the requirements of good agricultural techniques as specified by article 846 of the Italian Civil Code? Since the Italian constitution provided for the recomposition of what is now unreasonably spread, is it logical to assign small parcels of land to peasants of a size below the required limits for efficient levels of pro-

[29] The introduction of cows in certain zones caused great trouble and dissatisfaction in the beginning. "Most of the peasants had never had any dealings with these monstrous beasts, they found them troublesome to manage, and considered that they gave very little milk in comparison with the work involved in looking after them. At a meeting of peasants around Lucero in Northern Apulia, they put up one of their number to tell the director of the area that he must remove these horrible animals, which were merely a burden and wholly unprofitable—the use of manure was still almost as much a mystery to them as the cows who produced it. The director persuaded them to give the cows another chance, and in 1954 the spokesman was photographed as the proud owner of the prize winning cow at a local cattle show." (Margaret Carlyle, *op. cit.*, p. 134.

[30] Muriel Grindrod, *The Rebuilding of Italy*, (London, England: Royal Institute of International Affairs, 1955) p. 203, and Margaret Carlyle, *op. cit.*, p. 141.

[31] Margaret Carlyle, *op. cit.*, p. 141.

[32] Manlio Rossi-Doria, "Vicende e Problemi della Riforma Fondiaria all Luce del Secondo Anno di Experienza in Calabria," *Atti della Accademia dei Georgofili*, 6th series; Vol. XVL (Florence, Italy: Vallecchi, 1952), p. 25.

duction? Of what use was the allotment to the peasants of a few hectares of land if he was not put in a position to earn more and live better?[33]

It is sufficient to take a look at detailed plans of the project for the agrarian reform of the territories in the commune of Manfredonia to realize that critics have justifiable grounds to raise their questions. The Manfredonia scheme is one of thirty-five similar schemes directed by the Apulian Ente. The total area of 4,663 hectares has been divided into small holdings averaging from six to eight hectares according to productivity. The plan called for the division of each holding into fields twenty-five meters wide and each separated by a three-meter strip. It provided for the planting of half a hectare of grape vines, of olive trees along the strips and along the farm boundaries at a distance of twelve meters each, of forty fruit trees (figs, apricot, peaches, and the like), of seventy willow trees alongside water streams and canals, eight pecan trees around the house, two carob-trees at the well, and two pine trees at the holding entrance on the main road.[34]

From the above brief description of the Manfredonia project, one gets immediately the impression that the reformers wanted to form a small, self sufficient peasant ownership; to create an idyllic picture many times represented in Italian paintings, poems, and novels of the Romantic era. This, say the critics, may satisfy the poetic spirits but, they continue, high levels of production and a rational mechanized and industrialized agriculture are denied to such small holdings. According to these criticisms, the agrarian reform should have been directed toward the realization of great industrialized agricultural enterprises, leaving the small farms in the zones where they are economically sound.

Why then was the expropriated land parceled out in such small units?[35] One of the most important political forces participating in the drafting of Article 44 of the Italian constitution of 1948 was Christian democracy. Christian Democrats, most responsible for carrying out the provisions of the reform laws, following the teachings of the Catholic Church, reaffirmed again and again in the most important Encyclicals from the Rerum Novarum of Leo XIII to the more recent pronouncements of Pius XII, the diffusion of landed property as one of the fundamental premises for the moral and social elevation of the agrarian proletariat.[36] Also they consider it permissible and dutiful for the state to intervene with proper measures to promote such a diffusion.[37] Professor Francesco Vito, President of the Catholic University of Milan and the most venerated of today's interpreters of the economic doctrines of the Catholic Church, argued that Catholic doctrine is contrary to both individualistic capitalism and mechanistic collectivism; thus social reforms of any kind should not bring all fortunes to the same level but should eliminate the existing unjust distribution of wealth by the expropriation of uncultivated lands, the

[33] See, A Srepieri, "La Riforma Agraria in Italia," *Economica Internationale*, November 1954, p. 735; Giovanni Conserva, "Di Alcuni Aspetti della Riforma Fondiaria in Italia," *Studi Economici*, July-August, 1955, p. 338; Guilio Tamagnini," Cooperazione Agraria e Impresa Coltivatrice," *Rivista Italiana di Economia Demografia e Statistica*, January-June, 1956, p. 305, and Friedrich Vochting, *op. cit.*, p. 7.

[34] Giovanni Conserva, *op. cit.*, p. 337.

[35] See Table II.

[36] Pope Leo XIII in the Encyclical *Rerum Novarum* said in regard to peasants' ownership of land, that "when men know they are working on what belongs to them, they work with a far greater eagerness and diligence. Nay, in a word, they learn to love the land cultivated by their own hands, whence they look not only for food but for some measure of abundance for themselves and their dependents . . . . [and, because of that] . . . . there will surely be a greater abundance of the things which the earth produces." (Washington, D. C., National Catholic Welfare Conference, 1942).

[37] Enzo Giorgi, "Gli Interventi per la Diffusione e la Difesa della Proprieta Contadina," *Rivista Italiana di Demografia e Statistica*, January-February, 1956, *passim*.

fractionalization of latifundia, and the participation of the workers in the profits of enterprises.[38]

The author of the agrarian reform, Honorable Antonio Segni, and the Secretary of Agriculture at the time the Stralcio laws went into effect, Professor Amintore Fanfani, both scholars of Catholic social doctrine, could not but put into practice what they had learned and taught. They, however, mindful of the social and economic dangers that would have accompanied the reform if they had limited state intervention to the purchase and distribution of land,[39] embodied in the reform laws certain measures such as compulsory cooperation, the creation of rural centers, professional education and other measures to create the minimum necessary conditions for the consolidation of the peasant proprietorship. It must also be remembered that social pressure, in the name of social justice, demanded that the available land be divided as equitably as possible among as many people as possible, which means in small lots. In many zones of Calabria, Apulia, and the Po Delta, social pressure was becoming so dangerous that the land had be distributed even before the works of reclamation had begun.[40]

Does this mean that the problem is solved? Certainly not. Tomorrow it will reappear again with all its gravity. But tomorrow, as someone remarked, "there might be solutions that today are not possible or cannot be foreseen." One cannot forget, as Professor Rossi-Doria has pointed out, that in these zones, fatally poor, some sort of agricultural equilibrium will be possible only when more than half of the actual agricultural population is transferred to some other place or to some other job.[41] Meanwhile, the author is of the opinion that public intervention in the Italian agricultural sector should be channeled toward the development of secondary and tertiary activities in mainly agricultural zones; toward the prevention of greater pulverization of holdings which, if continued, would eventually reach "a pathological aspect as harmful as that of latifundo,"[42] and toward preparation of many of the farmer's children in other trades and professions.

[38] Francesco Vito, *La Reforma Sociale Secondo la Dottrina Cattolica* (Milano, Italy: Vita e Pensiero, 1945), p. 121.

[39] Some countries have done this and in them land reforms met with failure: Haitians slit the throats of the landowners, divided the land, and created a new class of landowners—"small, impoverished, with economic means sufficient only for a bare survival and none for growth." And the Mexicans "created small landowners but found that the latter were soon again gobbled up by the more powerful landlords . . . ." Earl Parker Hanson, *op. cit.*, p. 248.

[40] In the Apulia-Lucania-Basilicata reform zones, the poverty and land hunger of the peasants were so great that assignment of land had to begin three months after the publication of the first expropriation decree. Ente per lo Sviluppo dell'Irrigazione e le Trasformazione Fondiaria in Puglia e Luciana, *op. cit.*, pp. 6-7.

[41] Manlio Rossi-Doria, *loc. cit.*, p. 26.

[42] Enzo Giorgi, *loc. cit.*, p. 25.

# The Status of Rate-Making

*By* HARVEY C. BUNKE*

CONCEIVED in New England prior to the Civil War and given substance by the Granger movement of the 1850's, railroad regulation emerged in 1877 as a working instrument in the form of the Act to Regulate Commerce. As such, its conception, gestation, and birth are of another era—an era of homesteaders, individual entrepreneurs, unorganized workers, free markets, financial crises, and a nascent factory system. Of course every age has its tyrants—its vigilantees, its cattlemen, its southern planters, and its factory owners. Yet conditions during this brief period perhaps more closely approximated the economists' concept of competition than at any other time in history. It was the age of individualism. Each man was expected to follow his own penchant, to set his own values, and to pursue his own interests. Through self advancement, so it was held, the individual promoted the public weal. In pursuing his own selfish interest, the opportunity of the individual to abuse his neighbor and exploit his customers or clientele was automatically circumscribed by competition between firms and the ease by which outsiders could enter into the making and selling of goods. Monopoly, economic power, was nil or held to a minimum because no man was in a position to control supply in such a manner as to coerce another to enter into to a one-sided transaction. In the final analysis economic activity was directed by the autonomous and impartial market mechanism which ranked all buyers and sellers on equal terms.

No doubt the picture is overdrawn. It is probably true that competition was never so pure nor individualism so strong as some contemporary historians and classical economists would lead us to believe. Yet no one can seriously dispute that this was an era of small organizations. The fact that industries were populated predominantly by small organizations—the family farm being the classic example—precluded the concentration of power in the hands of one man or a group of men. And even when an individual or a group of individuals was in a position of power, because of the ownership of a strategic piece of land or the control of a critical skill, the extent to which power was exercised was influenced by the personal relationships upon which business activities were founded. Coercion is never an endearing approach. It is one thing to draft ruthless edicts in New York which are to be imposed in small Illinois towns; it is quite another to extract the last ounce from each bargain when one's business associates are the same people to whom one looks for social intercourse.

Such was the era of laissez faire, a period during which the government maintained, except for the unsightly stain created by an aggressive protective tariff policy, an all but unblemished record by restricting itself to the protection of private property and the enforcement of contractual obligations. To this society of 1830 came James Watt's invention in the form of a locomotive called "Tom Thumb." Initially viewed with apprehension, railroad companies were subsequently welcomed, then encouraged, and finally anxiously and aggressively courted by various groups and communities; only to find, once they had established service, that they were condemned, cursed, and despised by the

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very people who helped to make their development possible. Perhaps this was inevitable, for the railroad, more than any other factor, was responsible for the passing of the era which spawned and nurtured it.

### *Transition*

For a youthful nation of less than one-hundred years the building of the rail network was a major undertaking. This is especially true in view of the capital shortage which prevailed in this country during the period of railroad expansion. Railways required investments of a magnitude previously unimagined and, to get funds necessary for rapid development, railroad promoters took their case to the people of the areas in which they proposed to give service. These promoters begged, threatened, and promised —above all else they promised—that this new transportation medium would bring with it a far better and prosperous life. The rural people, living in relative isolation and receiving what seemed to them a pitifully small payment for their arduous labors, proved to be an easy mark for the railroad promoter. These people, on the basis of experience, believed that their economic destiny depended upon the availability of transport facilities. Exploiting this belief, promoters extravagantly claimed that, not only would a railroad-served region flourish because of the higher farm prices made possible by transport savings, but the level of prosperity would be further enhanced by the generous dividend to be paid to investors who through stock purchases made possible the construction of the line. Overwhelmed by the prospects of improved transportation, farmers and small communities enthusiastically supported railroad construction. Hard-earned savings were converted into securities, property was mortgaged for the purpose of investing in the railroads, and taxes were increased so that state and local aid was available for hastening construction work. In view of such sacrificial giving, it is not surprising that the attitude of the public changed when the promised utopia did not materialize.

But the failure of the railroads to make good the promises of the promoters was only one of the factors which brought a marked change in the attitude of the public. Complete disillusionment came with the realization that the interests of the railroad were in direct conflict with the interests of those who had unstintingly contributed to making rail service possible and that the railroad frequently enjoyed and had every intention of using monopoly powers. Not only were the companies apparently bent on extracting from their previous benefactors everything possible by imposing high charges but, once they had commenced operation, they quickly relegated the small shipper to the role of a "second-class" citizen. And should the shipper be so impetuous as to complain about the indignities which befell him, company men made it clear that he should consider himself fortunate in being permitted to use the service of the railroad. Shippers accordingly were hesitant to demand their legal rights for fear that such requests might result in harsh retaliation. Here then was a situation which went beyond the understanding or the powers of agriculturally-oriented people. Resentful of absentee ownership, which seemed to exert an undue amount of influence in determining their economic lot, and ignorant of the economics of price discrimination, railroad rate structures appeared to them as a classic example of an arbitrary and malicious use of power.

### *The Act to Regulate Commerce*

Economic and political conditions of the 1870's and 80's made railroad regula-

tion inevitable. Whereas once the economic philosophy of the "invisible hand" had been all but invincible, the appearance of large organizations in the form of the railroads caused it to show cracks of vulnerability. Unlike in most other areas of economic activity, competition between railroad organizations was not assured and enormous capital requirements effectively precluded outsiders from quickly entering the business and providing the competition necessary to eliminate any monopoly power that might temporarily be exploited. But great moments in history are rarely made of abstract thoughts and sharp changes in social systems are the results of strong provocation which cause widespread discontent among the populace. The railroads provided such provocation.

To state that the Act to Regulate Commerce was politically inspired is to state a truism. It came as a reaction to power and its sole purpose was to curb power. Whatever the economic implications of this piece of legislation, and there were many, they were incidental to the major objective which was to preclude the further concentration and use of private power. The essence of this statute is captured by the words "just and reasonable" which appear in Section 1 of the law. All of the other five sections of the law were drafted for the purpose of implementing Section 1 which provided that rates must be "just and reasonable." Clearly this phrase denotes a problem in ethics. It implies that certain conditions "*ought to be.*" In this case what "ought to be" were the conditions of economic freedom which prevailed prior to the time the railroads appeared on the scene: a society in which no individual or group of individuals exercised broad economic powers over others. A free society is of course a moral standard. Unfortunately, economics is not a very useful discipline for evaluating moral standards except as they involve economic efficiency. Accordingly, as long as the primary purpose of regulation was to provide a climate of economic freedom, economics had little to contribute. Should, however, the issue shift from one of power per se to economic efficiency then the science of economics becomes the logical policy-making instrument.

### *Transportation in the Mid-Twentieth Century*

Our mid-twentieth century bears little resemblance to that of the post civil-war period. The nineteenth century society was, for the most part, one of individuals, whereas the mid-twentieth century in which we live is one of organizations. Economic activity for most of the nineteenth century was dominated by the individual entrepreneur which looked to the automatic functioning of the market mechanism for direction. Today, as our institution continues to reflect changes in technology, we look less and less to the market mechanism for direction and more and more to large organizations for leadership and guidance. In business we have our General Motors and our United States Steel; in labor, our Teamster and United Mine Workers Unions; and even the last of the individualists, the farmer, turns to large organizations, such as the Farm Bureau and Farmer's Union for the protection of his interests. Whereas once the transportation companies—the railroads—appeared to the individual proprietor as did Gulliver to the Lilliputs, many of our smaller transport companies must surely view today's world as did Gulliver the land of Brobdingnag. Moreover, even those transportation companies—some railroads—which, by any standard are large, no longer are in the position to exercise great monopoly powers.

In days gone by, the shipper had a choice between using railroad service and paying the charges demanded, exorbitant though they might have been, or not using rail service at all. In today's world of pipe-line, water, rail, motor, and air carriers, the shipper may choose from any one of a number of services offered by public carriers; and, should public transport fail to suit his purposes, he may, through the use of a motor vehicle, supply his own transport needs. No one can seriously question the existence of competition between firms and between different transport media. Intense competition in the transport industry has been recognized by leaders in every walk of life. It has been discussed by politicians, industrial executives, writers, and educators; it is often the subject of newspaper and magazine editorials, and frequently is the primary issue in proceeding before the Interstate Commerce Commission and the Supreme Court. And more often then not, the position is taken that the industry is suffering from excessive rather than deficient competition. So strong, so effective, and so universal is this competition that no one carrier or transportation agency can ever feel that its position is secure. The railroads, once derisive of the motor carrier and which only recently came grudgingly to the admission that the motor vehicle provides a superior service for transporting certain commodities such as manufactured goods and perishables for relatively short distances, now see their very existence threatened as motor carriers continue to increase their scope of operations by transporting raw materials from areas traditionally considered sacred railroad hunting grounds. Nor are the established motor carriers without their anxious moments. Always wary of their arch enemy, the railroad, everywhere they see competitive service or the threat of it in the form of motor vehicles operated by shippers, carriers exempted from regulation, or by the small truckers who are sometimes prone to ignore governmental restriction imposed on common carrier services. So all-pervasive is this competition that each carrier and each mode is constantly assessing and reassessing its position to determine what, if any, changes in rates and service policies are necessary to assure continued patronage by the shippers. In view of the present intensity of competition in the industry it is submitted that the primary function of governmental regulation has shifted from protecting the public from abuse of monopoly power to the development and maintenance of "sound and efficient" transport systems. Once competition has reached this stage, economics becomes the central issue in transport policy.

### *Rate Regulation*

In a paper such as this no purpose is served by detailing legislation which authorizes and prescribes the federal regulation of transport. Of greater significance to our discussion are the broad outlines of power exercised by the federal government, through the media of the Interstate Commerce Commission and the courts, in the regulation of rates. Governmental control is epitomized by maximum and minimum rate regulation, which it is the right and duty of the Commission to impose under certain sets of conditions. Maximum rate regulation, which involves establishing rate ceilings, dates back to 1906 and is the type of regulation which the public ordinarily associates with the railroads. Minimum rate regulation, the imposition of rate floors, though of more recent origin (1920), is in some respects, especially as it affects the ability of the different agencies to compete, the more important of the two major types of rate regulation.

Moreover, the intensity of transport competition has caused the focus of attention to be centered on minimum rate regulation. It is to the discussion of this subject that a large part of the remainder of this paper is devoted. But before discussing some of the more esoteric aspects of the problem, it would be well to look, if only briefly, at the Commission's view on the subject.[1]

In the famous *New Automobiles in Interstate Commerce* decision[2] the Commission made the following statement: "Whether a rate is below a reasonable minimum depends on whether it yields a proper return; whether the carrier would be better off from a net revenue standpoint with it than without it; whether it represents competition that is unduly destructive to a reasonable rate structure and the carrier . . ."[3] Thus, in the eyes of the Commission, no single criterion can be employed to determine minimum reasonable rates but each case must be decided on an *ad hoc* basis. Given this insight into commission policy it is necessary to examine the cost characteristics of several of the transportation agencies.[4]

### *Cost Structures and Pricing Policies*

When it comes to minimum rate regulation, the railroad is the culprit. And it is incorrigible! Whereas motor carriers experience in varying degrees a relatively small amount of fixed costs, railroads operate under conditions of high fixed costs which are explained by a number of factors, such as the scope and size of operations, the specialized equipment required, and the rigid regulation which often compels certain services to be offered at a financial loss. But the expense of right-of-way is the outstanding factor responsible for high railroad fixed costs. For all practical purposes, costs incident to these facilities remain constant irrespective of the volume of traffic carried. Competing transport agencies, on the other hand, use public-provided "right-of-ways" and, although the users may pay in the form of taxes an amount sufficient to defray the government cost of providing these facilities, in large measure carrier costs associated with the use of public "right-of-ways" tend to fluctuate with changes in volume of traffic. Gasoline tax payments, which vary directly with changes in motor-vehicle miles are a case in point.

It is because of the fixed nature of a large portion of railroad costs and the myriad different services offered by the railroads that railroad pricing policies often appear to be confusing if not contradictory. The use of Table I may be helpful to the understanding of rail pricing policies but, prior to analyzing the data presented, it is essential to understand fully the terms appearing therein. Variable cost refers to those expenditures that the railroad would *not* have incurred had product X not been carried from A to B by rail. Labor, fuel, maintenance, and depreciation costs properly fall under the heading of variable costs. Not included under this term are interest on investment, administrative costs which do not fluctuate with change in traffic volume, and other true overhead costs. Fully allocated cost is derived by adding a pro-rata share of fixed cost to variable cost. Thus in Table I the pro-rata share of fixed cost is assumed to be approximately 25 cents per ton and the fully

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[1] A thorough discussion of this subject is impossible here. For a comprehensive treatment of commission-minimum-rate policy, see S. C. Oppenheim, *The National Transportation Policy and Inter-Carrier Competitive Rates, Legislative History and Legal Interpretation* (Harrisburg, Pennsylvania: Evangelical Press, 1945); also, E. W. Williams, Jr., *The Regulation of Rail-Motor Rate Competition* (New York: Harper & Brother, 1958).

[2] 259 ICC 475 (1945).

[3] Ibid., p. 534.

[4] Although the analysis presented here is generally applicable to interagency competition, it is, for the sake of simplicity, confined to the evaluation of rail-motor competition.

allocated cost is $1.05 for every ton of X carried from A to B by rail. Contribution to fixed cost refers to the amount of revenue in excess of variable cost that the railroad obtains in hauling a given commodity. Since, by definition, total fixed cost does not fluctuate, it is management's objective to establish rates which

TABLE I—Situation 1: Cost and Demand Data for Shipping Product X from A to B

| Tons shipped | Railroad rate | Railroad variable cost per ton | Railroad fully allocated cost | Motor carrier variable and fully allocated cost | Tons carried by motor carrier | Tons carried by railroad | Railroad gross income | Railroad variable cost | Contribution to fixed cost |
|---|---|---|---|---|---|---|---|---|---|
| 1,000,000..... | $1.05 | $0.80 | $1.05 | $1.00 | 1,000,000 | 0 | $ 0 | $ 0 | $ 0 |
| 1,000,000..... | 1.00 | 0.80 | 1.05 | 1.00 | 990,000 | 10,000 | 10,000 | 8,000 | 2,000 |
| 1,100,000..... | 0.95 | 0.80 | 1.05 | 1.00 | 770,000 | 330,000 | 313,500 | 264,000 | 49,500 |
| 1,150,000..... | 0.90 | 0.80 | 1.05 | 1.00 | 575,000 | 575,000 | 517,500 | 460,000 | 57,500 |
| 1,200,000..... | 0.85 | 0.80 | 1.05 | 1.00 | 360,000 | 840,000 | 714,000 | 672,000 | 42,000 |
| 1,300,000..... | 0.80 | 0.80 | 1.05 | 1.00 | 130,000 | 1,170,000 | 936,000 | 936,000 | 0 |
| 1,350,000..... | 0.75 | 0.80 | 1.05 | 1.00 | 67,500 | 1,282,500 | 961,875 | 1,026,000 | −64,125 |

maximize the contribution to fixed cost even though charges may not cover fully allocated costs. This point can be illustrated if it is further assumed that the motor carrier charges a rate of $1.03 for transporting product X and that this rate cannot profitably be reduced because it approximates motor carrier variable cost.[5]

Given these assumptions, the railroad will impose a charge of 90 cents for transporting X. At this rate the railroad attracts a large amount of traffic away from the motor carrier and maximizes its contribution to fixed costs. Thus, although common sense may cause one to discard a policy which would lead to carrying traffic at rates below fully allocated costs, it should be clear from the illustration that the railroad's financial interest is often best served when rates are substantially below allocated cost.

Although it may be good railroad strategy to establish some rates below fully allocated costs, it does not necessarily follow that such a practice promotes the "public good." It has been pointed out that railroad pricing policies may result in the high-cost carrier transporting the traffic. Such a result would of course be socially undesirable for, although a few shippers may be favored with lower rates, such a policy would tend generally to increase the charges paid by the traveling and shipping public. In short, pricing policies which divert traffic to the high-cost carrier increase the nation's transportation bill and restrain the natural development and use of transportation facilities. In the illustration given it might appear that the high-cost carrier is transporting the greatest volume of traffic for, the rail charge of 90 cents notwithstanding, the total rail cost of transporting product X is $1.05, whereas the total motor-carrier cost is approximately $1.00.

But as a practical matter, the transportation of X by rail does not increase the nation's transportation bill; quite the contrary, it decreases it. This is true because of the fixed and specialized character of the rail plant. Much national

[5] Since Interstate Commerce Commission studies indicate motor carrier costs are predominately variable, it is logical to assume that motor carrier costs approximate variable costs.

wealth has been expended for constructing railroad facilities and, even though there can be little doubt that excessive enthusiasm and early governmental policy engendered much uneconomic railroad building, this is hardly relevant today. These facilities do exist and it is logical to employ them as efficiently as possible as long as they provide satisfactory service. In short, the fact that the nation foolishly overbuilt in the past does not mean that the nation should not make use of already constructed facilities.

The fact that a railroad may, for a considerable period of time, profitably carry certain types of traffic at rates substantially below fully allocated cost does not mean, however, that these low rates will be profitable indefinitely. Yet many transportation experts believe Interstate Commerce Commission minimum rate regulation is essential because rail management fails to increase rates as costs shift from a fixed to a variable status. The significance of cost shifts is demonstrated by the data presented in Table II. In Table II, it is assumed that the railroad must secure new equipment if it is to continue to carry product X. The moment management must replace rolling stock, capital costs, i.e., interest on investment, on these facilities shift from a fixed to a variable status. If, for example, the cost of improving and replacing rolling stock for the transportation of product X is 10 cents per ton shipped, the total variable cost incident to transporting product X rises to 90 cents and, if a maximum return is to be realized, the rail rate must be increased to 95 cents. Although this causes the rail percentage of the market to decline from 50 percent to 30 percent, it would be poor business indeed to continue to levy a charge of 90 cents when rail costs would decline by 90 cents per ton if product X were no longer transported by rail.

TABLE II—Situation 2: Cost and Demand Data for Shipping Product X from A and B

| Tons shipped | Railroad rate | New railroad unit variable cost | Railroad fully allocated cost | Motor carrier variable and allocated cost | Tons carried by motor carrier | Tons carried by railroad | Railroad gross income | New railroad variable cost | Contribution to fixed cost |
|---|---|---|---|---|---|---|---|---|---|
| 1,000,000..... | $1.05 | $0.90 | $1.05 | $1.00 | 1,000,000 | 0 | $ 0 | $ 0 | $ 0 |
| 1,000,000..... | 1.00 | 0.90 | 1.05 | 1.00 | 990,000 | 10,000 | 10,000 | 9,000 | 1,000 |
| 1,100,000..... | 0.95 | 0.90 | 1.05 | 1.00 | 770,000 | 330,000 | 313,500 | 297,000 | 16,500 |
| 1,150,000..... | 0.90 | 0.90 | 1.05 | 1.00 | 575,000 | 575,000 | 517,500 | 517,500 | 0 |
| 1,200,000..... | 0.85 | 0.90 | 1.05 | 1.00 | 360,000 | 840,000 | 714,000 | 756,000 | −42,000 |
| 1,300,000..... | 0.80 | 0.90 | 1.05 | 1.00 | 130,000 | 1,170,000 | 936,000 | 1,053,000 | −117,000 |
| 1,350,000..... | 0.75 | 0.90 | 1.05 | 1.00 | 67,500 | 1,282,500 | 961,875 | 1,154,250 | −192,375 |

*Minimum Rate Regulation in the Abstract*

The most successful and perhaps most emotional appeal for rigorous Commission minimum rate regulation arises from the alleged fear that the railroads will "drive the motor carriers out of business" if they are free to establish competitive rates. The all too general acceptance of this argument occurs because the issues are viewed in terms of black or white rather than in the varying shades of gray they take on. There can be no serious doubt that some motor-carrier traffic would be diverted to the rails if the latter were permitted to practice variable cost pricing but this is hardly the same as saying the motor carriers would not be able to function profitably. The motor

carriers quote many rates below railroad variable cost and, even when rail rates are lower, very often traffic will move via highway because of the superior speed and convenience offered by motor vehicle. It is not, therefore, a matter of which mode will supply a given market but rather a question of how a whole series of markets are to be divided among the competing modes. For this and other reasons, rail rates tend to be at levels which give the motor carriers sizable portions of the market.

It is often argued that if the rails were permitted to price competitively, they would temporarily reduce rates below variable costs only to increase them again once the motor carriers were driven from the market. This is a naive but unfortunately a deceptively appealing argument. In the first place, no serious student would remove the power of the Commission to intervene where rates were clearly below variable costs and, in those cases where the Commission might be ineffective, even unenlightened rail management would surely soon see the fallacy of such a policy as a means of gaining a monopoly position. Certainly a railroad, because of its superior resources, could, by reducing rates, force competing modes out of a given area and in rare instances could even cause a competing carrier to discontinue operations entirely. But let the railroad raise rates again to profitable levels and it will find, because of the ease of entering and expanding motor carrier operations, that the temporary monopoly position is again challenged by vigorous motor competition.

There is one other argument now in vogue which is used to justify existing Commission minimum rate regulation. It is contended that, if the carriers are permitted to price competitively, rates will tend to gravitate to the lowest possible level and none of the transport agencies will earn an adequate return on investment. There is less merit to this argument than would appear at first glance. In the first place, the motor carriers which traditionally make this point are the least likely to suffer a reduction in the rate of earnings if charges decline. Since motor carrier costs are predominately variable, a decline in rates would cause a reduction in motor carrier services and, although total profits may fall, the rate of return need not. Of course, it can be argued that the railroads must be protected from their own proclivity for indiscriminate and wholesale rate-cutting. Yet if history teaches anything, it reveals that all the forces of government were insufficient to enforce rate competition among carriers for any extended period of time. If, despite government policy, the railroads saw the disadvantages of price competition, one would hardly expect irresponsible rate-cutting to be practiced during a period when public policy and regulation forbade it. Cautious rate-cutting could be expected only in those instances where such a practice gives real promise of increasing rail profit.

But if it is assumed for the moment that competitive pricing would tend to push rates to a subnormal level, can existing minimum rate regulation produce the desired result? The response to this question must be unequivocally negative for, if rates are artificially maintained through minimum rate regulation, inevitably the carriers with predominately variable costs will expand and the industry as a whole will continue to be plagued by the perennial peacetime problem of excess railroad capacity. One may argue that a certain amount of excess capacity is not only desirable but necessary for national defense purposes but in doing so it should be recognized

that any policy which results in excess rail capacity also tends to reduce rail earnings to a level which may be inadequate to permit railroad development and improvement. A policy which maintains rates at artificially high levels may, from a national defense standpoint, give the desired short-run results because it leads to immediate excess rail capacity. When viewed over a longer period, however, such a policy restricts earning capacity and in a real sense impairs the railroad's ability to meet future emergency defense requirements.

*Some Empirical Evidence*

The two major opponents in the minimum-rate-regulation controversy are the railroads and the regulated motor carriers. But while the regulated motor carriers enthusiastically sing the praises of this form of regulation and the railroads just as vigorously condemn it, a third party, which we will call the unregulated carrier, is quietly and effectively capturing a larger and larger share of the transport market.

It is, of course, no closely guarded secret that with each passing year since the close of World War II the share of traffic carried by the railroads has, without interruption, declined. The growth of water, pipeline, and air transport has been a factor in this decline; but the greatest single factor which explains the falling railroad share is the explosive expansion of motor transport traffic. In the twelve-year period 1945-1956, the railroad percentage of the total intercity ton-miles dropped from 67.3 to 48.2. At the same time the motor carrier percentage jumped from 5.4 to 18.7. Frequently the decline in the rail position is explained in terms of traffic diverted to the regulated motor carriers. A close examination of Table III makes clear the oversimplification of such an explanation.

Table III divides ton-miles of motor carrier traffic into two classes: (1) ton-miles recorded by regulated carriers engaged in common carriage operations; (2) ton-miles recorded by contract and non-regulated carriers. For the purpose of simplicity common carriers subject to economic regulation are referred to as regulated carriers, whereas exempt and contract carriers are classified as non-regulated carriers even though contract carriers are subject to a limited amount of economic regulation.

According to Table III, the ton-miles recorded by the regulated motor carriers increased from 24.8 billions in 1945 to

TABLE III—Distribution of Rail and Motor Vehicle Intercity Ton-Miles: Selected Years

| | Ton-Miles (Billions) | | | | Percentage of Total | | |
|---|---|---|---|---|---|---|---|
| Year | Total Rail And Motor | Rail | Motor Regulated | Motor Contract And Private | Rail | Motor Regulated | Motor Contract And Private |
| 1945..... | 803.1 | 736.7 | 24.8 | 42.1 | 91.7 | 3.1 | 5.2 |
| 1948..... | 804.7 | 688.7 | 42.6 | 73.4 | 86.6 | 5.3 | 9.1 |
| 1951..... | 874.4 | 686.4 | 66.9 | 121.1 | 78.5 | 7.6 | 13.8 |
| 1954..... | 771.2 | 556.6 | 62.2 | 152.4 | 72.2 | 8.1 | 19.7 |
| 1956..... | 909.7 | 655.9 | 74.5 | 179.3 | 72.2 | 8.1 | 19.7 |

Computed from data given in Interstate Commerce Commission, *Transport Economics*, April 1956, p. 4; October 1956. p. 10; October 1957, p. 7; December 1957, p. 9.

74.5 billions in 1956. In 1945 the regulated motor carriers accounted for 3.1 percent of the ton-miles reported by both the rails and the motor carriers; by 1956 the regulated motor carriers accounted for 8.1 percent of the ton-miles operated by both rail and regulated motor carriers. This is a record of which motor carrier management is justifiably proud. Yet the growth of the regulated motor carriers' share of the traffic has not been abnormally rapid. Of the total ton-miles of traffic transported by the rails and regulated motor carriers, the rails still account for approximately 90 percent of the ton-miles.

The expansion of unregulated motor transport is an entirely different matter. It is estimated that the unregulated motor carriers produced 42.1 billion ton-miles of traffic in 1945. For 1956 the estimate is 179.1 billions. Between 1945 and 1956 the unregulated motor carrier's share of the ton-miles reported by both motor carriers and rails jumped from 5.2 percent to 19.7 percent. Thus, during a period which saw the regulated carriers increase annual ton-miles from 24.8 billions to 74.5 billions, the unregulated carriers increased their output from 42.1 to 179.3 billion ton-miles, and while the regulated carriers approximately tripled their scale of operations, the volume of unregulated operations more than quadrupled.[6] The extent to which over-the-road haulers are capturing certain portions of the transport market is indicated by a United States Department of Agriculture study which showed that 70 percent of the nation's interstate frozen poultry traffic and 82 percent of its fresh poultry shipments were carried by exempt carriers during the year 1957. In 1952 the ICC estimated that 30,000 exempt carriers were in operation; for the year 1958 this estimate has been revised to 48,000.[7] These statistics do not seem to bear out those who so glibly argue that rigid regulation is the only means of assuring satisfactory motor carrier service.

### *The Transportation Act of 1958*

The Transportation Act of 1958 was signed into law by President Eisenhower on August 12, 1958. This piece of legislation deals with a number of facets of transport regulation but, in view of the limited scope of this paper, only those aspects of the law which are related to price competition and rate-making will be considered here. Specifically the law provides that, "rates of a carrier shall not be held up to a particular level to protect the traffic of any other mode of transportation, giving due consideration to the objectives of the national transportation policy declared in this act." The first clause in this sentence would seem to indicate that the Commission may continue to impose minimum rates as a means of curtailing price competition within the various transport industries but that it is no longer empowered to set rate floors as a means of curbing inter-agency competition. The second clause, directing Commission attention to the national transportation policy which provides that regulation should be administered in such a way as to "recognize and preserve the inherent advantage" of each of the transport agencies, seems however to imply that the Commission may deny a proposed rate reduction if, in the opinion of the Commission, the new rate represents a "destructive competitive practice" and it gives one agency an "undue advantage" over another. Under the rules of statutory construction, on the

[6] Unfortunately, no data are available covering the division of water traffic between the regulated and unregulated carriers, but one would expect the patterns of growth in the water transport industry to be similar to those observed in the area of motor transport.

[7] *Wall Street Journal*, May 27, 1958, p. 1.

theory that Congress has some purpose in mind when it legislates, it is presumed that this 1958 amendment will require a change in Commission rate policy. Although it is impossible to know the import of this new legislation until the Supreme Court makes clear the meaning of the law—and this may take a number of decisions handed down over a period of years—there can be little doubt that Congress employed this amendment as a means of expressing a certain amount of dissatisfaction with Commission policy and in effect gently "rapped the Commission's knuckles" for failing to allow price competition to play a greater role in allocating the traffic among the competing transport agencies.

*Recapitulation*

The era that gave life to rate regulation is gone. The day of the railroad riding rough shod over a society of small organizations is long past. Competition, not monopoly, is the chief characteristic of the transport market. At the turn of the century regulation was needed to protect the public from power frequently abused by large transport companies. Today regulation emphasizes the "fostering and preservation" of a "sound and economic" transportation system. The primary issues facing the regulators is therefore no longer essentially one of ethics but is largely one of economics. Stated in another way, the major problem is to provide, at minimum cost, transport commensurate with the public's wants and needs.

The thesis advanced here is that Interstate Commerce Commission policy is the key to industry rate-making, that in the final analysis it is the Commission which sets the pattern which all must follow. In rendering decisions the Commission not only resolves the issue at hand but also sets forth the future course of action management is expected to follow. Hence, before any major change in rate-making can be affected, it is essential that governmental policy be changed.

It is, of course, true that governmental policy is not consistent. Sometimes ethical standards are employed; at other times decisions turn on economic considerations. The use of ethical standards is apparent in both minimum and maximum rate regulation. For example, the Commission in setting minimum rates has in many instances disregarded costs, the only valid criterion for measuring efficiency, in favor of the so-called "fair share" philosophy. That the fair share of the market is a function of relative costs is not a fact that the Commission is always willing to face. Ethical standards are also employed in establishing maximum rates. Having stated that rates must not be "unconscionably high" and that carrier revenue is not the "paramount and controlling factor" the Commission resorted to subjective measures which bear a marked resemblance to Aristotle's "just price" in the setting of maximum rates.

But even if the commission were to rely solely on economic criteria, there is reason to doubt the efficacy of regulation as an instrument for developing an economical transportation system. At best Commission decisions are based on some kind of average and therefore are incapable of coping with specific situations. It can be no other way. For the Commission to attempt to investigate the circumstances underlying every rate and give weight to the multiplicity of factors which bear on each particular case would be physically impossible. Ratemakers are confronted with literally millions of different situations, each of which differs with respect to cost and demand.

While the regulatory approach may at one time have provided a tolerable economic climate, the appearance of a vehicle—the motor truck—which enables the shipper to supply his own transport needs or use the services of exempt carriers, makes obsolete any rate-making procedure which must rely on gross averages as a basis for developing freight rates. As long as a large portion of the industry is permitted to operate as it sees fit, compelling regulated carriers to charge rates built on averages, the unregulated carriers will exploit those markets in which rates are high and avoid those markets in which rates are equal to or below cost. Eventually, the regulated carriers are left only the "traffic dregs." Experience in both Britain and France would seem to bear out this statement.

*Recommendations*

Economics dictates a fundamental change in rate-making policy. A shift in policy which would emphasize competitive pricing is essential if the transportation system—specifically the railroads—is to continue to be operated as an economic enterprise. In order that each transport agency may have the opportunity to perform the services for which it has the greatest advantage, carriers should be permitted and encouraged to establish individual rates which reflect the cost of and the demand for specific services. The first step in the accomplishment of this objective must be the liberalization of governmental regulation so as to permit the carriers greater freedom of pricing. It is therefore recommended that:

1. The power of the Commission to impose minimum rates as a means of controlling interagency competition be limited to those instances where proposed rates hold little promise of covering the direct cost of producing the service. Since direct cost is used here in the narrow sense, the power of the Commission to reduce interagency competition would be substantially reduced.
2. The power of the Commission to impose maximum rates be limited to instances where the question of "fair return on fair value" is relevant. The power of the Commission to overrule carrier management on the grounds that a proposed rate will not produce the anticipated revenue should be eliminated. To accomplish the latter objective it would be necessary to strike out the provision of the Interstate Commerce Act which requires the Commission to consider the "effect of rates on the movement of traffic."
3. The Interstate Commerce Act be amended, eliminating the provision requiring carriers to charge only the published rate. This amendment should empower the Commission to impose rate ceilings consistent with recommendation number 2, but at the same time allow the carriers to negotiate individual rate agreements so long as the rates charged did not fall below direct costs.

It is one thing to pass a law; it is quite another to alter institutions, break traditions, and modify established practices and procedures. Today's rate-practitioner knows only the world of governmental protection and restriction. It is therefore not surprising that his every thought and deed reflects acceptance of governmental guidance and leadership. Top railroad executives, of course, insist on the need for freedom of pricing; those who are responsible for making day-to-day rate decisions are not however equally anxious to see a change in governmental policy. These men quite naturally look to the Interstate Commerce Commission as the guardian-protector but for which the industry would suffer the ravages of "destructive competition." That private and exempt carriers continue to expand their scope of operations and capture a larger and larger share of the market is something which they prefer

to ignore or explain as a passing phenomenon. Hence, if the regulated companies are to compete effectively, accompanying a change in governmental policy must be a willingness on the part of rate-makers to adopt a new and aggressive philosophy of rate-making. More attention must be given to economic research, cost determination, intensive selling, and the needs of the individual shippers. While those who would alter governmental policy to conform with economic reality face a difficult task, an even more difficult assignment confronts those who would bear the responsibility for changing the thinking of the practicing rate-maker.

It might be hoped that a change in governmental policy will be effected with the greatest possible dispatch. Under the best of conditions attaining economic operations in the transport industry will be a slow and frustrating process. And the plight of the eastern railroads indicates that time is fast running out. If the railroad industry is precluded from, or is inherently incapable of, attracting more traffic and greater revenues through aggressive pricing, the inevitable consequences are a further contraction and deterioration of rail service. Failing all else, it is a certainty that, at some point, major legislation will be enacted to halt the decline of the rails, but as to what form this legislation will take, this writer has neither the temerity nor the clairvoyance necessary for prediction. It is worth noting however that governmental policy must, perforce, reflect a number of factors, only one of which is economics.

# Toward a Water Resource Development Program for Eastern Rivers†

*By* GUTHRIE S. BIRKHEAD* and JESSE BURKHEAD**

THE period of complacency about water resource development in states along the eastern seaboard is coming to a close. Newspapers and popular magazines carry articles with dire predictions as to future shortages. We have become an extremely growth-conscious nation and there is widespread awareness that increases in total population and in national income will bring pressure on our resource base or, at minimum, bring new technological requirements for the use of such resources.

Public agencies are by no means insensitive to the future of eastern water resources. Every session of the Congress brings the introduction of new proposals for strengthening the participation of the federal government in water resource development. Every session sees the enactment of a few such ideas, sometimes with features that are particularly significant for eastern water policy. Currently the Senate Select Committee on Water Resources is conducting a series of hearings on regional water problems and the eastern seaboard has not been omitted from the schedule. A dozen or more federal administrative agencies are gradually extending their activities in water resources, including eastern areas.

Nor are the states inactive. In 1958 New Jersey citizens authorized $45.8 million of bonded indebtedness for the development of Raritan River tributaries to meet industrial and municipal water needs in northern New Jersey. Pennsylvania has developed a plan for the utilization of the Brandywine. The New England states are actively promoting a Northeastern Water Compact.

It seems safe to predict that the next decade will bring increased general awareness of water requirements in the eastern states. The need for specific water programs will crystallize and make more forcible entry into the arena of public policy. As architects have long said, form follows function; new organizational arrangements will be devised to deal with these water programs. New patterns of intergovernmental and regional action are certain to emerge from the present organizational pluralism.

It is easy to forecast that water programs and organizational arrangements therefor will take on new importance and dimensions in eastern valleys in the next decade. But it is much more difficult to forecast with precision the relative importance of particular programs or the character of the institutional determinants that will shape both policy and organization. No claim to prescience is made here. The observations on which this paper rests have been drawn wholly from the Delaware Valley. Comparative experience in other eastern river valleys has not been explored in depth. Nevertheless, it may be at least hoped that

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these observations have reasonably wide applicability to the whole of the urbanized eastern seaboard. "One river—one problem" expresses a kind of insularity that ought to be avoided by social scientists. They must seek continuously for a commonalty of experience more widely applicable to a number of river valleys.

### *I. The Institutional Setting*

The setting for eastern river valley water policy has at least three characteristics that in varying degrees distinguish it from other sections of the country.

First, this is an industrial-urban complex. The strip of the eastern seaboard running from the greater Boston metropolitan area south to Hampton Roads, Virginia has been called a megalopolis. This area embraces only about 1½ percent of the total land area of the continental United States but contains 20 percent of the nation's population. This megalopolitan strip contains five major river valleys—the Connecticut, the Hudson, the Delaware, the Susquehanna, and the Potomac. Average per capita incomes are substantially higher here than for the nation as a whole and further absolute increases in population and personal income are to be expected. Nevertheless, this whole area is one of relative economic decline as compared with other sections of the United States economy. As is well known, the next several decades will bring a more rapid growth rate in the West and Southwest than along the eastern seaboard. In this situation a water-resource program is significant for further economic development but is by no means the key to that development. Adequate supplies of industrial and municipal water will be important in holding existing industry and in attracting new firms.[1] Additional navigation facilities are needed for some rivers and will contribute to the development of specific transport-oriented firms and industries. Programs for pollution abatement and water-based recreation will make the region more attractive as a place to work and live and thus, in a generalized fashion, contribute to economic development.

The locational significance of industrial and municipal water is very specific with respect to industry and place. The future of the garment industry in New York City does not depend upon the availability of increased supplies of water since the garment industry is not a heavy water user; but the expansion of the steel, petroleum refining and chemical industries does depend on adequate supplies. There is no general measure of the significance of industrial and municipal water for the location of industry as a whole. Each industry and, in fact, each firm within an industry, has its own specific water requirements. Investment in water resources in eastern river valleys cannot be expected to unleash the kind of development potential that characterized the Tennessee Valley in the 1930's. The most that can be hoped is that public and private water programs together with other public and private development programs will maintain existing growth rates.

A second characteristic of the setting for eastern water policy is that land areas for water-resource development will be difficult and costly to secure. A comprehensive water development program requires extensive sites both for reservoirs and for adjacent recreation areas. Along the eastern seaboard open spaces are rapidly being chewed up by

[1] For a discussion of water in relation to the New Jersey economy, see Solomon J. Flink, editor, *The Economy of New Jersey* (New Brunswick, New Jersey: Rutgers University Press, 1958), p.p. 99-115.

private economic development. There is an obvious case for immediate steps to plan future construction and for imposition of controls such as zoning to protect prospective reservoir areas. Only in this way can the costs of future development be held down. However, such controls are very difficult to secure since there is today no generalized public awareness of their significance.

A third characteristic is that the concept of hydrologic unity has limited meaning for eastern river valleys. Here major rivers are but a few miles apart and water can be imported or exported without prohibitive costs. About half of New York City's water supply is to be met by an 800 m.g.d. diversion from the Delaware to the Hudson Valley. The largest oil refinery in the east, located near the mouth of the Delaware, has plans for the importation of water from the Susquehanna. The notion that the waters of a specific river "belong to" the people inhabiting that river valley may be deeply rooted in custom and tradition in some parts of the country but it has little applicability to the East.

This absence of hydrologic unity means that there is little regional feeling centering on the rivers themselves. The Connecticut Valley, the Hudson Valley, the Delaware Valley—these are not social, economic, or political regions. This fact makes for great difficulty in devising appropriate administrative patterns, a problem which will be discussed below.

The remainder of this article is devoted to an examination of (1) the interests that shape eastern water policy, (2) major water programs, and (3) organizational alternatives.

### *II. Water-Related Interests in the East*

Relative abundance of water in the East has meant until recently that water policy issues have had low visibility. The occasional flood, hurricane, or drought has only driven that point more securely home. It seems probable that action and reaction by individuals and groups will be mobilized mainly by localized crises in the immediate future and directed at discrete parts of the process of water management. A general sense of water crisis may, however, be in the making.

The process of water management may include: (1) Research. (2) Planning. (3) Designing, building, operating, and maintaining capital structures of many types—dams and reservoirs, powerhouses and generators, treatment plants, sewage disposal plants, power distribution facilities, hatcheries, ground-water recharge structures, irrigation works, etc. (4) Operating programs for withdrawal and diversion control, quality including salinity control, adjusting to floods, marketing and distributing hydro, recreation, fish and wildlife, and upstream watershed management. (5) Public information. Together, these functions comprise the comprehensive, multiple-purpose development of water and water-related resources. To list them is to illustrate the complexity that prevents these general concepts from being effective, deep-cutting instruments in most policy debates. It is on the more concrete parts of the total process that individual and group pressures commonly are focused in the form of operations that directly affect water, contacts with key legislative and executive officials, news-releases, studies, discussions, conferences, and the whole range of public relations techniques. The most active interest groups in the Northeast now are the incumbent public officials, certain semi-public and private enterprises, and a few citizens associations.

*Government Programs and Officials.* Governments have regulatory or program activities in every phase of the above

process, although the scale or extent of participation is great in only a few phases. And the very welter of governments comprises one of the main reasons why dissatisfaction with present water administration is growing. In the Delaware Basin, for example, there are an estimated 23 national agencies, 43 state departments and commissions, 14 interstate organizations, and at least 252 local water supply enterprises engaged in water-resource management or closely related activities. Each such activity collects its own publics of clienteles, lawyers, engineering consulting firms, suppliers, and other affected or interested persons. The ways in which contractors converge on the Corps of Engineers and in which farmers unite to support soil conservation activities have been well documented.

To members of the general public, that the programs exist at all is sometimes a compelling reason to hope for no more governmental activity, although to others the highly-fragmented picture is a basic argument for reform and reorganization. Public officials in these varied programs may react as laymen do, a fact of perhaps greater importance because they frequently are cast in the role of official planner or advisor about prospective change.

Furthermore, two well-known bureaucratic tendencies are always operative and they may be adjudged healthy or not as they work in specific cases. First is the "empire-building" or, in its milder form, the "we-can-do-it-better-than-they-can" feeling—the reluctance to relinquish a job, once started, to another agency whether from another or the same government. Maintenance of personal and organizational prestige is a constant preoccupation in government as in private affairs. For example, there have been a few mutterings about the "big dam-little dam" dichotomy in the Delaware Basin although the strife has yet to break into the open.

Second, professional motivation is a key influence in launching new programs and gaining better standards in water administration. The multiple-purpose and comprehensive development concepts have been most attractive to physical scientists and engineers; geologists and hydrologists have recognized clearly the need for basic data about water; engineers and power economists ordinarily understand best the complex issues in a hydro-power proposal. Professionals in and out of government support their ideas strongly in high places. The voice of science is heard in the land today and one ignores it at his own risk in any policy discussion.

*Private Enterprise.* The occupational stake many public officials find in the *status quo* is not unlike the vested interest the businessman usually decides to defend. Eighty percent of the water used today in the Delaware Basin and neighboring areas is self-supplied by industrial users and thus their stake in the preservation of their sources and in more efficient water use is heavy. The Delaware ratio is apparently very high yet in Massachusetts industrial water use is about twice domestic use. In Connecticut self-supplied industrial water amounts to well under half that coming from public water systems.[2]

A more specific breakdown of water users in the Delaware reveals the major industries that will continue to be active in concern over water policy. Thermal-power generation, petroleum refining, other chemicals, basic steel, and paper

[2] Commonwealth of Massachusetts, *Report Submitted by the Legislative Research Council Relative to Rights to Surface and Sub-Surface Water in Massachusetts*, February 13, 1957. Senate, No. 695, pp. 54 and 56; State of Connecticut, *Water Resources of Connecticut, Report to the General Assembly by the Water Resources Commission*, 1957, pp. 7, *ff.*

and board manufacturing use quantities of water in that order. Like virtually all industries these have an additional cause for concern in the effects they have on water quality. There is good evidence, at least in the Delaware, that industrial firms are increasingly recognizing their responsibilities for maximizing use in relation to withdrawals and for the treatment of effluents. On the other hand, control of municipal sewage plants has been easier than enforcement against industrial polluters in the Delaware as in the Hudson and Ohio Basins. The entire quality control problem is due to become vastly more serious with population and industrial growth. The thermal power industry has another concern, with the threat or supposed threat presented by construction of public hydroelectric power plants.

The list of water-using industries is of course long. Irrigated agriculture is swiftly growing on the eastern seaboard—since 1940 acres under irrigation have increased tenfold in Massachusetts and more than twenty times in Connecticut. Little land is available for this use and irrigation will never attain major status as a water user. Because, however, so much of it occurs in upstream areas, local crises seem destined to multiply as irrigation increases.

Next, the recreation industry is becoming more and more vocal in water matters. Much more dispersed and less highly organized than the other industries here mentioned, recreation is growing very rapidly. Finally, legal firms and engineering contracting and consulting firms from time to time have obvious stakes in the problems of water management. The nature of their interest is usually manifest in the clients they represent or the contracts they are fulfilling. The high influence of engineers and lawyers is relatively unstudied in its impact on water policy.

*Citizens Associations.* Woven into the web of water interest groups are many citizens associations. In the East few are as concerned with water as in the West, for reasons already made explicit. Nonetheless, chambers of commerce, Leagues of Women Voters, Isaak Walton Leagues, watershed associations, and others have begun to marshal forces in the Delaware as they have done long since in the Connecticut River Basin.[3] Several such groups commonly are based on the topographic watershed, although even they usually seek help where they can find it. The Water Resources Association of the Delaware River Basin was organized in 1959 from more than 200 citizens' associations in that Basin and in neighboring areas where Delaware water conditions have direct relevance, *e.g.*, the New York metropolitan area. This *ad hoc* association is composed of many varied interest groups. Whether it will be able to surmount the obstacle posed by its heterogeneous nature and go beyond public education to active support of a specific program for development of Delaware water is problematic.

No one of these northeastern water interests can impose its will on the others but at times one may exercise a veto power. There is no mechanism short of Washington to collect and reconcile views, to guide the bargaining process, to arrive at workable policies. Water has many narrowly-motivated friends in eastern basins but it has no strong protagonist. The interests find only theoretic integration or reconciliation, in the concepts of multiple-purpose use and comprehensive development.

[3] William E. Leuchtenberg, *Flood Control Politics* (Cambridge, Massachusetts: Harvard University Press, 1953) a near-classic account of the interplay of pressure groups in the Connecticut Basin from 1927-1950.

### *III. Water Programs in Eastern States*

*Industrial and Muncipal Water.* It is safe to predict that requirements for industrial and municipal water will increase generally and substantially along the eastern seaboard in the next several decades but the time and locational dimensions of such increases almost defy analysis. Efforts to project water requirements for a specific area over the next two or three decades are beset with an almost unbelievable amount of uncertainty. That condition is attributable to three factors.

The first is an absence of data about existing industrial and municipal water use and water supplies. There is very little information on the relationship between ground and surface water availability in eastern valleys. Information on domestic water use in major metropolitan areas is generally fragmentary and incomplete; per capita domestic use of water is thought to be subject to a secular increase but there is other evidence that challenges this conclusion.[4] Data on industrial water use are even more fragmentary than on municipal requirements. The first reasonably comprehensive survey of industrial water requirements is contained in the *United States Census of Manufactures* for 1954, and data for a single year do not permit of projection. The absence of data about industrial water use is most unfortunate since as much as 80 percent of all water requirements in some valleys along the eastern seaboard are industrial requirements. It may be noted that this absence of data is not particularly surprising in view of the fact that water commonly enjoys the status of a free good. Where an industrial firm can put a pipe in the river and withdraw all its requirements it has no reason to keep careful records of water use and the quality and quantity of return flow.

A second reason for uncertainty about the future of industrial and municipal water is that in any specific valley a major public policy decision may drastically alter patterns for future requirements and supplies. For example, in the Delaware Valley there is now discussion of the possibility of a dam across the estuary to transform the whole of the Delaware above its mouth into a freshwater stream. The proposal for a New Jersey Ship Canal is also recurrent. Either of these developments would greatly modify any projections that could be made now concerning water supply and requirements in this Valley. Similar although less dramatic decisions in other valleys calling for in-basin or out-of-basin diversions can change water patterns in a matter of years.

The third source of uncertainty is attributable to changing technology. There may some day soon be a breakthrough in desalinization techniques. Weather modification might become practicable to alter rainfall patterns in specific river valleys. Either of these developments, and both are certainly possible within the next two decades, would greatly increase economically available supplies of industrial and municipal water and would substitute for the construction of expensive traditional river control structures. Then there are the continuous ongoing technological improvements in industrial water use. Comparable firms within the same industry now have widely varying patterns of water use per unit of product.[5] Recirculation systems and cooling towers are utilized by some firms but not by others. As long as industrial water is both self-supplied

[4] Data gathered for the Syracuse University Delaware Valley Project for both the city of Philadelphia and the suburban Philadelphia areas show an almost constant per capita use of water for the years 1921 through 1958.

[5] C. G. Paulsen, "The Available Water Supply," *Water For Industry*, edited by Jack B. Graham and F. Burrill (Washington, D. C., 1956), esp. pp. 16, ff.

and a relatively free good, there is no reason why firms should economize in water use. But as water becomes more scarce and valuable, it is reasonable to expect that known water technology will be introduced and new water saving devices employed. Such developments will greatly reduce gross water requirements and thus postpone the need for major river control structures.

The first of these uncertainties—the absence of data—will be partially eliminated over the next several years as federal and state agencies undertake additional surveys, particularly for industrial water. However, the sheer accumulation of data will not eliminate the kinds of uncertainties that surround changes in technology and the impact of specific public policy decisions. Therefore, planning for future industrial and municipal water needs must retain a high degree of flexibility.

The pervasive uncertainty for both industrial and municipal water could be met at least partially by the establishment of an organizational structure with responsibility for continuous surveillance of supply and requirements. It might be possible for such an organization to inaugurate a permit system for all water users, both ground and surface. All industrial and municipal water users in a given valley, with appropriate exemption for small users, could be required to report their gross withdrawals, the extent of recirculation, and the quality and quantity of return flow. This kind of information collected over a period of years would provide invaluable information on water use trends.[6]

*Recreation.* In the comprehensive development of eastern river valleys recreation programs are second in importance only to industrial and municipal water. Increased interest in and expenditures for recreation are nation-wide postwar phenomena. Use of the national park system has increased by an estimated 8 percent per year in the postwar period. A comparable figure for national forests is 10 percent and for TVA reservoirs 15 percent annually.[7] Attendance at Corps of Engineer reservoirs increased twentyfold between 1946 and 1957. Increases in population and personal income may be expected to bring further acceleration in demand for recreation activities.

Water based recreation programs centering both on eastern rivers and at reservoirs to be constructed in eastern valleys will help to meet expanded needs and in addition can make a modest contribution to economic development. The Federal Reserve Bank of Philadelphia has estimated that vacation activity is one of the Reserve District's top ten in importance, about equal to agriculture or textiles. Approximately $600,000,000 is spent annually by vacationers in this district at resort areas.[8]

Recreation programs, although of undoubted importance, are particularly difficult to evaluate as a part of multiple-purpose project planning and justification. In recent years federal water resource agencies have set primary recreation benefits at $1.60 per visitor day, a figure arrived at by counting average expenditures for admissions and concessions within public recreation areas. This arbitrary approach neglects the important intangible values that arise from reservoir-based recreation projects and probably produces an under-investment in recreation facilities. Some economists have suggested alternative ap-

[6] The federal government undoubtedly has legal authority to establish such a permit system on any interstate river. However, given congressional attitudes toward water rights as exemplified in reactions to the Pelton Dam decision, it may be more appropriate to rest a permit system on the legal authority residing in the the states.

[7] Resources for the Future, Inc., *Annual Report, 1957*, (Washington, D. C.: 1957), p. 40.

[8] Federal Reserve Bank of Philadelphia, "On Vacation," *Business Review*, April and May, 1958, pp. 3-5.

proaches to the evaluation of recreation benefits and it may be that techniques will be employed in the future to reflect the benefits that are now disregarded.[9] In the absence of satisfactory evaluation techniques, decisions about reservoir-based recreation programs place a heavy responsibility on the planning staff. There are no specific criteria, value judgments abound, and there can be no firm guide-lines to investment in the recreation aspects of water resource development.

There are serious financial questions to be faced in the development of water-based recreation. As things now stand, the construction of major reservoirs by the Corps of Engineers or the Bureau of Reclamation brings a very limited investment in recreation facilities. Recreation is treated as an incremental rather than as a primary project purpose. Total federal costs will embrace access roads to the reservoir and "minimum basic facilities." Any additional investment incurred to make recreation values available must be assumed by state or local governments. Exceptions to this are found only in unusual cases where areas of "national significance for recreation purposes" are declared such by acts of Congress upon the recommendation of the National Park Service. Corps and Reclamation policy for the acquisition of land adjacent to the reservoir is also highly restrictive.

Federal policy may of course change, possibly as a result of recommendations by the Outdoor Recreation Resources Review Commission established by the 85th Congress. But in the absence of such a policy shift, heavy financial responsibilities will fall on state and local governments for development of recreation resources as part of comprehensive development.[10]

If the demands for water-based recreation increase as rapidly in the future as they have in the immediate past, it may be possible for state and local agencies to meet a part of their financial responsibilities by increased utilization of user charges. This would conflict with the established philosophy of state recreation agencies, now generally committed to providing mass recreation at minimum price. But a kind of differentiated-price recreation could conceivably be developed at attractive reservoir sites. This would contemplate the retention of large areas for parks, campsites, swimming facilities and playgrounds on the present minimum fee basis; but in addition there would be long-term leases for luxury hotels, motels, and marinas. The revenue possibilities inherent in differentiated-price recreation facilities should not however be exaggerated. The support of government agencies financed out of general revenue will certainly continue to provide the bulk of future recreation revenue.

*Hydroelectric Power.* In eastern river valleys hydroelectric power has far less program importance than for western water projects. The undeveloped hydro potential of most eastern rivers is small in relation to the total of electric power re-

[9] See Marion Clawson, *Methods of Measuring the Demands for and Value of Outdoor Recreation*, Washington, D. C.: Resources for the Future, Inc., 1959; Andrew H. Trice and Samuel Wood, "Measurement of Recreation Benefits," *Land Economics*, August 1958, pp. 195-207.

[10] Financing water resources development in eastern basins would be substantially facilitated if the federal government were to assume responsibility for low flow augmentation—the cost of providing storage for water releases to increase minimum stream flows. Experience in measuring low flow is limited but most benefits in the East would probably accrue to water supply and recreation programs (the leading case is the West Branch Mahoning Project in the Ohio Basin, H.D. No. 191, 85th Cong., 1st sess., Washington, 1957). In 1958 the President vetoed a bill that would have provided federal financial support for projects with low flow features but there is continued strong support for this type of legislation in the House Committee on Public Works. Implementation will require distinguishing between widespread, general and non-exclusive benefits that might be financed by federal funds and measureable benefits that could be made reimbursable.

quirements. In the Delaware, for example, the proportion of potential hydro to existing total electric power capacity in the Valley amounts to only about 5 percent. But hydro power can be far more significant than this figure suggests since revenues therefrom can be used to support other aspects of water development.

Firm power generation sites on eastern rivers are about exhausted and the future of hydroelectric development lies almost wholly in its utilization for peaking purposes rather than for base load. Hydro power has technological flexibility not possessed by thermal power and apparently the incremental value of peaking power will increase rather than diminish over the next several decades. An important part of the future of hydro development in eastern rivers lies in the utilization of pumped storage and the integration of such units with existing grid systems. Indeed, the stage is set for new arguments about public versus private development at pumped storage sites.

If public development obtains, it will be possible to secure maximum power values only by sale for peaking purposes to a grid system (public or private). But if such contractual arrangements are effectuated, it should be possible in many eastern valleys to market power at a modest surplus over cost. These net revenues in turn could be utilized to support other water programs that are not inherently income-producing, such as recreation and research and planning. With an appropriate administrative organization it might also be possible to use such a surplus of revenue for the control and possibly the acquisition of future reservoir sites.

This approach to power marketing would come in conflict with some but not all of the provisions of existing federal public power policy. Section 5 of the Flood Control Act of 1944 is the controlling statute and would presumably be applicable in all cases where federal funds are used for the construction of dams and reservoirs in eastern valleys. Section 5 states that the Secretary of the Interior has responsibility for marketing all power produced at structures built by the Corps of Engineers; that power rates are to be set to recover the cost of producing and transmitting such energy including, in practice, amortization with interest; that rate schedules are to be approved by the Federal Power Commission; and that public bodies and cooperatives are to be given preference in the sale of such power.

Preference policy is, of course, the hotly controversial part of this Section. Although the Adminstration has actively sponsored a number of partnership arrangements that would have modified established preference patterns, none of these has yet been approved by the Congress and there is no reason to believe that the Congress will alter this stand in the foreseeable future.[11]

It should be possible to market hydro power within the spirit and intent of the preference clause by negotiating three-party agreements for eastern valleys similar to those extensively employed by the Southeastern and Southwestern Power Administrations. Under these contracts the public agency responsible for power marketing negotiates contracts with private utilities to wheel and firm with supplemental generation the hydro power produced. The contracts assure that hydro capacity will be used for its most efficient purposes, *i.e.*, for peaking. The interests of the preference customers

[11] For a history, see, Commission on Organization of the Executive Branch of the Government, *Task Force Report on Water Resources and Power*, "The Preference Clause in Federal Electric Power Development and Distribution," 1955, pp. 1107-1150; Henry P. Caulfield, Jr., *Federal Electric Power Policy*, Resources for the Future, Inc. (unpublished), Washington, D. C., 1958.

are met by the exchange of peak power for an equivalent amount of base power; the private utilities agree to serve the preference customers in accordance with their requirements. The limits of preference entitlement are set by the estimated firm power that could be produced if the project were to generate nothing but firm power. The marketing agency reimburses the private companies for the expenses of wheeling and firming.[12] The possible significance of pumped storage for eastern rivers suggests however that the limits of preference-customer entitlement may need to be redefined. It may be appropriate for preference customers to claim whatever combination of firm or peaking power can be utilized effectively.

If conflicts over preference policy can be satisfactorily resolved in eastern river valleys, power marketing policies will still encounter difficulties with respect to the level of rates. If hydroelectric power is to provide revenue that could make a contribution to comprehensive water resource development, rates must be set above minimum assignable cost. This would require a modification in Section 5 of the Flood Control Act as applied to eastern rivers.

Such modification would not, of course, represent a drastic departure from established patterns at Bureau of Reclamation projects in western states. Here it has been the practice for many years to set power rates above minimum assignable costs in order to meet project costs beyond the capacity of irrigators to pay. Whether this represents an unwarranted subsidy, as its opponents have long charged, is a controversy that will not be entered into here. The important point is that federal practice does in fact sanction the utilization of hydroelectric power revenue to cover non-power project purposes.

This suggested approach to power marketing policy for eastern river valleys rests both on some observable facts about public power in these valleys and on a philosophy of water resource development. The facts are that public power distributors are relatively unimportant in eastern valleys as compared with the South and the West. They depend and will continue to depend on non-public generating sources to meet load requirements. An aggressive policy for public power rate reductions with the yardstick approach could not be expected to have important impact on the aggregate of power rates along the eastern seaboard. Municipally-owned utilities and cooperatives are too small and too widely-scattered to produce any kind of significant demonstration effect.

The philosophy on which this approach rests is a value judgment that water resource development in eastern river valleys and accompanying economic development will require a flexible application of revenue to program. Net revenue from the sale of hydroelectric power, it may be hoped, will produce more desirable long-range benefits in terms of additional investment in water resource programs than if such revenues were proliferated into small electric rate reductions haphazardly distributed.

In this approach to power marketing it should be possible to reach agreements that are mutually advantageous to the three parties immediately involved: the power marketing agency, presumably representative of water resource interests as a whole in a given valley, the private utilities, and the preference customers. This is a bargaining approach to power pricing. The minimum would be set at

[12] The leading case is the Attorney General's ruling for power produced at Clark Hill in Georgia. See, U. S. Senate, Committee on Public Works, *Power Rates—Southwestern Power Administration*, 84th Congress, 2nd Session 1956, pp. 680-687.

the cost assigned for hydro-project purposes. The maximum rate would be determined by the system requirements of prospective purchasers and their alternative costs. Rates would be established within this range; net revenue would be applied to financing other aspects of the water development program.

### *IV. Government for Water*

If the concepts of multiple-purpose use and comprehensive development are to be effected, more rational governmental and administrative machinery will be required. This very persuasive case has been made a number of times before Congress, by national study agencies, and by several separate river basin study commissions. The lack of a proper resting place in the national government for basin water administration has been demonstrated time and again. Throughout the United States the national government has already assumed the functions of research and data collection, flood control, upstream watershed management, and various phases of many other water-related functions. To date, however, attempts to unify administration of these activities or to wrest single activities from agencies where they have previously been vested have been unsuccessful.

Further, the inability of states and localities to handle these water functions has often been underlined. Three of the Delaware Valley states compare very favorably with the other forty-seven as to wealth, administrative know-how, and experience in the field of water, but it is unrealistic to expect them to undertake alone the unified development of the water resources of that Basin. Pennsylvania's flood control program, New Jersey's water supply efforts, and New York's hydroelectric power program evidence the capabilities of these states in discrete water functions.[13] In addition however to lacking wide enough geographic reach, their general revenue structures are not adequate for financing substantial appropriations. These states fall far short of having comprehensive water programs as defined by the Council of State Governments.[14] They lack the professional personnel, the organization, and the techniques for pursuing stepped-up programs in the field of water.

There are examples in other states of multiple-purpose and basin-wide water agencies. One of the few such, Texas' Lower Colorado River Authority, approximates those conditions and yet it was underwritten almost entirely by federal relief funds. On the other hand, the Massachusetts Metropolitan District Commission's water operations apparently are becoming multiple-purpose in nature and there the national government's role has been minimal. Where interstate waters are concerned, however, the states have apparently been unable to spark development.

There is good reason to argue that the present system of participation by both states and national government in policy-making and administration for the complex field of interstate water resources management should be continued. The federal system as we have it is a flexible system, one that has throughout our history been altered from time to time to allow for new programs and new techniques. Many of the unsolved problems of water policy and administration may be met by re-shaping American federalism for water purposes. Two possible devices are set forth here. Other persons will be able to suggest alternatives.

[13] The Power Authority of the state of New York is pursuing relatively minor recreation and flood control purposes at its St. Lawrence installations.

[14] *State Administration of Water Resources* (Chicago, Illinois: 1957), pp. 66, ff.

*Adapting the Interstate Compact*

First, the device of the interstate compact might be revamped to allow more direct participation by the national government than has heretofore been the case. A number of political scientists have urged more use of the traditional compact, often with special reference to water problems.[15] No multiple-purpose, operating agency for a basin or series of basins has yet been created by compact. A Delaware River draft compact proposed by the Interstate Commission on the Delaware River Basin would have established such an agency but that idea failed to pass the Pennsylvania Senate in 1953. Likewise, a Missouri River draft compact was advanced by the Missouri River States Committee and the Council of State Governments. The governors of those states voted in 1955 to drop the idea. The success of the Port of New York Authority (outside the the water field) seemingly has demonstrated that the compact can be used to create program agencies, although many persons adjudge it merely the exception that proves the rule.

There are a number of objections to the use of the interstate compact, based on both theory and experience. With regard, however, to several of the following objections there are good reasons to believe that slight alterations in practice or emerging developments in eastern water programs may provide ways out or around.

(1) State representatives in compact negotiations have rarely been willing to give strong powers, of either regulatory or service nature, to compact agencies. Most compact agencies have depended heavily upon powers of persuasion and publicity. There are, of course, exceptions. Three pollution control compacts—on the Hudson, the Ohio, and the Klamath—provide that the basin agency may enforce its quality standards against municipalities as well as industries.[16] The Hudson River agency (Interstate Sanitation Commission) alone has employed this weapon more than a decade ago. These precedents for such stringent standby powers may be viewed as having broken the ground for future compact drafters. Effective interstate water agencies in the East will require some strong powers.

(2) State representatives have been unwilling or unable to provide sufficient funds for large-scale program activities by compact agencies. The availability of federal appropriations for flood control, irrigation, power generation, and other purposes has provided part of the justification for this situation. On the other hand, traditional revenue sources for state governments are relatively inelastic. Revenue bonds have supplied the capital for a few compact agencies. Charges for water use, as uses multiply and as further research makes possible the preparation of equitable schedules, could be levied by compact agencies. They could then resort to revenue bonding. Some changes in eastern water law would be involved in bringing this about, although there are good precedents in eastern states for controlling and charging for water uses.[17]

(3) Compacts are often criticized because unanimity among participating states is apparently a condition *sine qua non* for their acceptance. For many western water compacts disagreement on

[15] For instance, see F. L. Zimmermann and M. Wendell, *The Interstate Compact Since 1925* (Chicago, Illinois: Council of State Governments, 1951) and R. H. Leach and Redding S. Sugg, Jr., *The Administration of Interstate Compacts* (Baton Rouge, Louisiana: Louisiana State University Press, 1959).

[16] In 1958 Congress approved a Tennessee River Basin Water Pollution Control Compact which will give a new agency there power to enforce its anti-pollution orders in court. 72 *Stat.* 823.

[17] For example, see New Jersey P. L. 1947, Chap. 375, amended by Chap. 195, P. L. 1951.

supply questions has been reduced to a common denominator by dividing the estimated total of water in a given stream among the states and writing the state shares into the compact instrument.

No such interstate apportionment has been carried out by compact in the East. On the Delaware River, New York and New Jersey have gone to the Supreme Court to gain the use of specific amounts of water and this may serve as a precedent for future actions there or in neighboring states.

The growing sense of impending water crisis in the East, however, may clear the air so that constructive steps can be taken via the compact route. During the time lag before the eastern states begin to demand their shares of the total water in interstate rivers, compact negotiators might forestall the western habit of dividing water for eternity in compact negotiations. For example, a compact agency might be given the power to allocate water among users, irrespective of state lines. Flexibility in allocation could thus be attained and the function might be closely allied with broad basin planning and with operation of the principal river control structures by the same agency. Appeal to the courts from all administrative decisions would of course remain a fundamental right.

Implementation of this idea again would require many changes in existing eastern water law. The need for that change is, however, being recognized in many responsible quarters today. And it seems certain that broad reviews and some alterations of the water law situation will be undertaken in many eastern states in the next few years.[18]

(4) Compact agencies have often been indicted for partaking of the mediocrity of state administration in their operations. The danger that this will happen is heightened by the fact that states so often neglect compact agencies, their own creations.[19] The Port of New York Authority may again be invoked, to be sure, as a shining, lonely model of efficiency. Whether or not a general indictment could be upheld, indifferent administration may be a characteristic of states and compact agencies with which we will have to learn to live in the long run, secure in the knowledge that there will be recurring efforts at reform.

(5) Compact negotiations and compact agencies are sometimes criticized for blurring or cutting into executive authority and functions in the states. Compact negotiators may speak as much for legislators as for governors, and this is not a happy situation in eastern states where party control frequently varies between legislative and executive branches. The whole question of the condition of legislative-executive relationships is thus a part of the question of the suitability of the compact device for any purpose.

The key to most of these puzzles may turn out to be the growing pressure to act decisively on the eastern water situation. Particularly mitigating circumstances suggest that new adaptations may make compacts more workable, to fit better the realities of intergovernmental relations today.

Greater participation by the national government might relax some of the foregoing tensions and help to circumvent practical obstacles. This idea has a few precedents. For the past twenty

[18] In Massachusetts among other states water law is already under study. See Commonwealth of Massachusetts, *op. cit.* South Carolina and Mississippi have recently instituted sweeping changes in their water law. An attempt is currently under way in Delaware. New York State is studying the problem. See also, David Haber and Stephen W. Bergen, eds., *The Law of Water Allocation in the Eastern United States* (New York: The Ronald Press Co., 1958), especially p. xxxvii.

[19] Richard H. Leach and Redding S. Sugg, Jr., *op. cit.*, Chap. 2.

years representatives of the national government have been participating in many kinds of compact negotiations and a regular procedure has been set up by the Bureau of the Budget for that purpose.[20] For example, five western compacts since 1949 (on the Canadian, Sabine, Klamath, Bear, and Upper Colorado Rivers) have provided for a federal representative on the compact commission. In each of these the federal representative is the chairman, although only on one (the Upper Colorado River Basin Compact Commission) has he a vote in commission deliberations. Here are solid precedents on which to design eastern compact commissions. In the case of the Upper Colorado River Basin Commission, no votes have yet been taken—reportedly it operates by consensus. The primary purpose of that compact is that of most western water compacts, to settle the issue of which states get how much water from the river. Lacking any power to do other than plan and collate basic data, however, the UCRB Commission is not an agency in the pattern one would otherwise adjudge most suitable to the eastern situation.

A stronger national government role could be affixed to a compact agency as a principal means of gaining expression of more than state interests. The sovereign character of the national government would always be the chief consideration in making such an arrangement. Presumably, the terms of a compact would have to recognize that condition. On the other hand, a compact could specify the good intentions of the federal establishment and could acknowledge the need for state-federal collaboration. Channels for bringing regular budgetary requests to the President and Congress could be prescribed therein. Decisions might be made only by majority vote, including the vote of the federal representative. And further details might be threshed out. The principal difficulties in drafting such a compact would be overcome if negotiators could convene with a common desire to attain success and to cooperate. In fact, the Delaware River Basin Advisory Committee has launched an interstate-federal compact drive in this spirit and is now discussing a first draft of an instrument designed to attain that goal.[21]

### *Adopting the Federally-Created Basin Agency*

A second possibility deserves even more attention than does adjustment of the compact: by federal law basin water agencies incorporating state representation could be established. This possibility needs to be set against its background.

The persuasive rationale for vesting a new basin water program in an existing agency of the national government is so well known that it needs no extensive discussion. Less commonly is it pointed out that there are grave risks in such a course of action. The national government is generally organized along functional lines for water resources purposes—no single agency is in a position to operate a multiple-purpose program in a major basin. Further, new ideas often are smothered by the on-going policies, attitudes, and workways of an old department. Specific professions ordinarily dominate in an existing organization—and a comprehensive program may well be out of place in the hands of flood

[20] "Guide to Federal Participation in Interstate Compact Negotiation," (Washington, D. C.: January 3, 1956, duplicated). Federal representatives have participated in more than thirty compact negotiations in recent years. Wallace R. Vawter, "Interstate Compacts—The Federal Interest," in Commission on Organization of the Executive Branch of the Government, *Task Force Report on Water Resources and Power* (Washington, D. C.: 1955), Vol. 3, pp. 6294-5.

[21] Water Research Association of the Delaware River Basin, I *Delaware Basin Bulletin* 2, Philadelphia, November, 1959.

control experts, navigation engineers, soil conservationists, or other specialists.

Furthermore, the idea of putting a new water program for an interstate river somewhere in the established framework of federal administration is most puzzling to put into practice. Water is admittedly not a clear-cut organizing principle and the dispersion of responsibility for water programs among national agencies reflects that fact. Despite the recurrent call to mend this situation (by two Hoover Commissions and a half-dozen other study groups) the situation persists. A case is sometimes made that the Corps of Engineers should become the central agency for long-term development of water resources in one or another of the eastern basins. The Corps, however, has long emphasized flood control and navigation and has yet to prosecute a balanced, multiple-purpose program. Next, the point has been impressively made that the Corps should have no civil functions at all.[22] The argument is founded on the location of civil activities in a military department, on specific policies and engineering practices of the Corps considered unwise, on the undue influence of nongovernmental interests in this agency's work, and on the anomalous organizational situation noted above. Placing a new basin program in the hands of the Corps can be justified for no reasons other than those of expediency.

Some critics see a resolution of these difficulties in the inter-agency committee device. In recent years a number of such committees has operated but none of them has been based upon solid legal foundation and none of them has performed the kinds of positive functions that seem to be demanded for eastern river basins. Inter-agency committees on the Columbia, the Missouri, and in the Pacific Southwest stemmed from the old federal Inter-Agency River Basin Committee and from state desires for participation in federal agency deliberations. NENYIAC, AWRIAC, and the current Delaware Committee derive from congressional committee or Presidential directives. They have been temporary-study devices and have ordinarily disbanded when reports were finished. The two new inter-agency study committees for the southeastern states and for Texas, created in 1958, are of this variety.

Some of these committees have served moderately well for communication and discussion of problems across organizational lines. One is hard put, however, to find any important example of their bringing coordination among federal agencies or states, and their capacity for operating control systems or action programs has never been tested at all. Until members of such committees find ways to surmount agency loyalties and professional barriers to attain better understanding, the inter-agency committee is bound to remain a weak substitute for more satisfactory arrangements. Nevertheless, if unified water resources administration will be furnished for eastern river basins at an early date, it will probably be by passage of a congressional statute. If a means of focusing attention and efforts, valley-by-valley, is to be attained, if the obvious strengths of using a federal statute are to be exploited, the divided character of the federal administrative establishment must be surmounted. It should be possible, without destroying the integrity of existing water resource agencies in the federal government, to establish a new agency for any of the northeastern river basins.

[22] Arthur A. Maass, *Muddy Waters: The Army Engineers and the Nations Rivers* (Cambridge, Massachusetts: Harvard University Press, 1951); and Albert L. Sturm, "Civil Functions of the Corps of Engineers—Relation to Military Mission," Commission on Organization of the Executive Branch of the Government, *Task Force Report on Water Resources and Power* (Washington, D. C.: 1955), Vol. 3, pp. 1473-1578.

To the commission heading such an agency, the President might appoint state members from nominees made by the relevant governors, and in addition he might appoint a chairman from a list of his own selection. Such a commission could of course be a policy-making agency, could wield virtually any of the requisite powers over water programs, and could appoint a full-time executive director to head a staff chosen solely on the basis of merit. And in other respects it could operate in manner almost the precise parallel of that of a federal-interstate compact agency outlined above.

In most respects, the federally-created basin agency makes better sense than other possibilities. The national interest can be best expressed through any agency directly responsible to the President. Many of the relevant water and water-related functions already are the province of national agencies. Major capital expenditures, at least in the early stages of eastern water development, will be provided by Congress. Finally, national direction ensures that the area of administration will encompass the totality of water and water-related problems.

The final point deserves elaboration. As time goes on, not only will unified basin administration of water activities be needed but also the need to coordinate inter-basin problems will emerge. At some future date, several basin agencies may parallel each other, say, from the Connecticut to the Potomac Rivers. Dominant federal participation in the governing bodies of all would provide a policy-integrating factor that would be lacking if the agencies were based on interstate compacts alone. The ultimate national function that is indicated is that of recognizing common patterns and inter-relationships from basin to basin and formulating policies based on such recognition. The administrative means for doing this may be within our grasp, short of a complete break with the traditional federal system.

State representation on such federally-created basin agencies would give an explicit means of voicing less-than-national problems and needs. Thus channels to the center of basin policy would be provided for regional and local interest groups. The importance of specific local knowledge and of human needs would be symbolized thereby. There might appropriately be more such state-nominated representatives than national representatives on a basin commission, although the national representative(s) should be ensured the formally dominant voice in any decision.

Under such a system, regional government would be in a sense coalition government. The states and localities would not necessarily be weakened thereby; instead, their valid roles as representatives of an array of interests would be maintained. The activities they perform in the field of water would thus be acknowledged, and a means of further gearing together those activities would be created. A focus would come into being for the varied interests that hinge on water and that extend over traditional boundaries.

# A Suggestion for Improving Public Utility Regulation

*By* JOHN W. ASHLEY*

SEVERAL writers in the field of public utility regulation either imply or explicity assert that it is the state legislature which determines the effectiveness of a state's public utilities commission. "It is the legislature which determines whether the utility commission will be weak or strong, whether adequate financial provisions will be made . . .; in short, whether a commission will be reasonably effective or whether it will be helpless."[1] A helpless commission is limited in the functions it may perform and generally is inadequately financed. The range of functions of a reasonably effective commission include:

"1. Through the issuance of certificates of convenience and necessity, the determination of whether a company may discontinue service, or expand, and whether a new company may enter the field.
2. The responsibility, in varying degrees, for determinations regarding the issuance of securities, the making of investments, and the effectuation of mergers.
3. The establishments of valuations of utility properties so as to secure a rate base on which to fix permissible earnings.
4. Decisions as to what constitutes a fair return on the investment.
5. Fixing the rates that may be charged for the service.
6. Approval and policing of standards of satisfactory service.
7. Approval and supervision of standard methods of accounting and depreciation."[2]

As to finances, "in 1947 the total appropriated to 48 commissions was but $15,500,000 and of this $7,000,000 went to four commissions (New York, California, Pennsylvania, and Illinois)."[3] Clair Wilcox claims that, "in a few states, notably New York, Wisconsin, Illinois, and California, utility commissions have earned a reputation in the past for vigor and effectiveness. But, by and large, the verdict of scholars on the performance of such bodies has damned them with faint praise".[4]

In spite of the wide range of functions and the relatively large budget of the better commission, there still remains one general complaint which is succinctly expressed as follows:

"We think it fair to say that the Commission, by overestimating the judicial side, has neglected what was originally conceived to be its primary function—to advance the interests of the public in relation to the service of utility companies."[5]

James Fesler's study, which included among others the better commissions of Massachusetts, New York, Wisconsins Illinois, and California, clearly support, this complaint.[6]

The purpose of this paper is to consider the complaint by inquiring into certain aspects of the operating procedures of one state commission, the California Public Utilities Commission, in order to identify the cause of the problem and to suggest a possible remedy for it. In terms of the criteria that have been used, there can be little doubt that the California Public Utilities Commission is one of the most effective in exis-

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[1] Merle Fainsod and Lincoln Gordon, *Government and the American Economy* rev. ed. (New York: W. W. Norton & Company, Inc., 1948), pp. 310-1.

[2] Marshall E. Dimock, *Business and Government* rev. ed. (New York: Henry Holt and Company, 1953), pp. 472-3.

[3] Clair Wilcox, *Public Policies Toward Business* (Homewood, Illinois: Richard D. Irwin, Inc., 1955), p. 502.

[4] *Ibid.*, p. 571.

[5] New York (State), Commission on Revision of the Public Service Commission Laws, *Report* (Brooklyn, New York: Legislative Document (1930) No. 71), p. 14.

[6] James W. Fesler, *The Independence of State Regulatory Agencies* (Chicago: Public Administration Service Bulletin No. 85, 1942), pp. 13-5.

tence. Its range of functions includes all those listed above; its commissioners are among the highest paid; its operating budget is one of the largest; and it initiates rate and other investigations on its own motion.

It is the responsibility of the California Public Utilities Commission to enforce the provisions of Section 451 of the Public Resources Code which requires all California utilities to maintain adequate and efficient service and charge just and reasonable prices. In carrying out this responsibility the Commission, between 1946 and 1957, granted nine certificates of convenience and necessity to public utilities to construct natural-gas pipe lines from the Arizona-California border to San Francisco and Los Angeles.[7]

Of major significance in these decisions has been the size of pipe line to be installed. The determination of the most appropriate size is neither simple nor obvious because a number of variables involving engineering, economics, and forecasting must be considered. There are five principal physical variables of significance in the design of gas pipe lines: 1) outside diameter of the pipe; 2) wall thickness of the pipe; 3) pressure of the gas being transported; 4) horsepower required to obtain the desired pressure; and 5) location of compressor stations. A given quantity of gas may be transported between two points by use of a small diameter pipe line at high pressure or by a large diameter pipe line at low pressure. Lower pressures require less wall thickness than do high pressures. Similarly, the amount of horsepower required may differ not only as the pressure differs but also as the location of the compressor stations might differ. As an example, the tabulation below shows a few of the different combinations of pipe diameter, pipe wall thickness, pressure, and horsepower capable of transporting 175 million cubic feet of gas per day a distance of 200 miles with an inlet pressure of from 100 to 500 p.s.i. (pounds per square inch).

While other combinations also exist, this should be sufficient to demonstrate how the factors are physically substitutable. The best combination of these factors depends upon their costs. Comparing their costs is a fairly time consuming task, but not at all difficult.

[7] Decision 38668 (February 5, 1946), 46 Cal. P.U.C. 339; Decision 38962 (May 14, 1946), 46 Cal. P.U.C. 458; Decision 42460 (January 25, 1949), 48 Cal. P.U.C. 395; Decision 47492 (July 22, 1952), 51 Cal. P.U.C. 812; Decision 47494 (July 22, 1952), 51 Cal. P.U.C. 822; Decision 48663 (June 1, 1953), 52 Cal. P.U.C. 575; Decision 49101 (September 15, 1953), 52 Cal. P.U.C. 744; Decision 52436 (January 4, 1956), 54 Cal. P.U.C. 595; Decision 53121 (May 22, 1956), 55 Cal. P.U.C. 236.

| Pipe Diameter (inches) | Pipe Wall Thickness (inch) | Initial Inlet Pressure (p.s.i.) | Compressor Stations (number) | Required Pressure (p.s.i.) | Required Horsepower (number) |
|---|---|---|---|---|---|
| 20 | ½ | 500 | 1 | 1,100 | 9,000 |
| 20 | ½ | 500 | 2 | 800 | 12,000 |
| 20 | ½ | 500 | 4 | 575 | 20,000 |
| 30 | ¼ | 400 | 0 | 400 | 0 |
| 30 | ¼ | 200 | 3 | 200 | 17,250 |
| 30 | ½ | 300 | 1 | 300 | 6,000 |
| 40 | ¼ | 200 | 0 | 200 | 0 |
| 40 | ¼ | 100 | 3 | 100 | 15,750 |

Estimates of future gas requirements must also be considered. For example, the total annual cost of operating a large diameter line at less than maximum pressure may be slightly greater than that of a small diameter line operated at its maximum permissible pressure. This greater cost might be worth while if expected future requirements were great enough to fully utilize the capacity of the larger line in a relatively short period of time as compared with building a new smaller line subsequently when needed.

An investigation of the nine decisions referred to above, as well as the transcripts of testimony and supporting exhibits, reveals that no one ever questioned the appropriateness of the size of pipe line proposed by the applicant utilities. In the first decision in 1946,[8] the Commission authorized the Southern California Gas Company and the Southern Counties Gas Company jointly to build a 26-inch pipe line for the importation of Texas natural-gas. In granting permission to build this line, the question of most economical pipe diameter was never raised. In the second 1946 decision,[9] it was at the request of the applicants that the pipe diameter was increased from 26 to 30 inches. In Decision 42460,[10] the Commission gave the Pacific Gas and Electric Company its choice between a 30-inch and a 34-inch line. Similarly, in every subsequent decision, the only size of pipe line ever considered was that introduced by the applicant.

The significance of this passive behavior by the Commission in terms of higher costs to consumers is demonstrated by a detailed comparison of costs between a 30-inch line recently authorized by the Commission[11] and a less expensive 36-inch line that could have been used had the Commission required it.

This pipe line, which has already been built, runs from Topock, on the Arizona-California border, to Newhall, 40 miles north of Los Angeles, a total distance of 236 miles. It has a 30-inch outside diameter, three-eighths inch wall thickness, and a daily capacity of 415 million cubic feet at its maximum allowed gauge pressure of 936 p.s.i.[12] This size was the only one proposed by the applicants in spite of the fact that a 36-inch line was available which could have transported the same quantity of gas at a gauge pressure of only 600 p.s.i.

In comparing the costs of transporting gas using a 30-inch line versus a 36-inch line, extensive use has been made of a 1956 pipe line cost study prepared by the Bechtel Corporation for the Southern California Gas Company and the Southern Counties Gas Company.[13] The same costs as those shown in the Bechtel study are also used here. Finally, the same method of computing pipe line capacity as that used by the Southern Counties Gas Company is used. Since these methods and costs are identical for the two lines considered, the differences in the results obtained are attributable only to the one factor which is different, namely, the difference between a 30-inch and a 36-inch pipe line. The results of these computations are shown in Table I.

The direct cost of the 36-inch pipe line is slightly more than that of the 30-inch line because more steel is required in it. However, since the larger line requires much less compressor station equipment, the total project cost is considerably below that of the smaller line. The lower total investment required for the larger

[8] Decision 38668, *op. cit.*
[9] Decision 38962, *op. cit.*
[10] *Op. cit.*
[11] Decision 53121, *op. cit.*

[12] Application 37014, *Transcript of Record* (San Francisco, California: Public Utilities Commission, 1956), pp. 310-2.
[13] Bechtel Corporation, *Gas Transmission Cost Study* (January 1956), [appears as Exhibit 34 in Federal Power Commission Docket No. G-4769].

TABLE I—Costs of Two Pipe Lines at Various Operating Pressures
(thousands of dollars)

| | Pipe Size = 30" x ⅝" | | | | Pipe Size = 36" x ½" | | |
|---|---|---|---|---|---|---|---|
| | 700 psi | 800 psi | 900 psi | 936 psi | 500 psi | 550 psi | 600 psi |
| Total direct cost of pipe line | $22,631 | $22,631 | $22,631 | $22,631 | $22,727 | $22,727 | $22,727 |
| Total direct cost of compressor stations | 2,657 | 3,523 | 4,793 | 5,024 | ..... | 1,848 | 2,426 |
| Total cost of pipe line project | 26,552 | 27,462 | 28,795 | 29,038 | 23,863 | 25,804 | 26,411 |
| Annual operating costs: | | | | | | | |
| Pipe line operating costs | $ 60 | $ 60 | $ 60 | $ 60 | $ 60 | $ 60 | $ 60 |
| Pipe line maintenance costs | 57 | 57 | 57 | 57 | 63 | 63 | 63 |
| Compressor station operation and maintenance costs | 105 | 140 | 184 | 192 | ..... | 63 | 93 |
| Miscellaneous costs | 22 | 26 | 30 | 31 | 12 | 19 | 22 |
| Fuel costs | 172 | 256 | 358 | 386 | ..... | 88 | 145 |
| Administrative costs | 146 | 170 | 199 | 204 | 81 | 123 | 143 |
| Total annual operating costs | $ 562 | $ 709 | $ 888 | $ 930 | $ 216 | $ 416 | $ 526 |
| Annual fixed charges | 3,319 | 3,433 | 3,599 | 3,630 | 2,983 | 3,226 | 3,301 |
| Annual total costs | $ 3,881 | $ 4,142 | $ 4,487 | $ 4,560 | $ 3,199 | $ 3,642 | $ 3,827 |
| Quantity of gas (millions of cubic feet per day) | 302 | 351 | 403 | 422 | 340 | 377 | 416 |
| Average cost of transporting gas (per thousand cubic feet) | 3.5¢ | 3.2¢ | 3.1¢ | 3.0¢ | 2.6¢ | 2.6¢ | 2.5¢ |

line makes the annual fixed charges lower. Also, regardless of the quantity of gas transported, the annual operating costs of the larger line are significantly below those of the smaller line. Not only are the compressor station operation and maintenance costs lower but the cost of fuel is materially lower. If the price of compressor fuel (natural gas) should continue to rise as it has, the relative advantage of the larger pipe line would be increased. While the difference in average transport cost of 3.0 cents and 2.5 cents per thousand cubic feet may not appear significant, it is, nevertheless, a 20-percent difference and amounts to $733,000 annually.

All the information necessary to make these computations was available to the Commission and to the applicant utilities. The Commission required neither its own staff nor the applicants to make the computations. Such computations were never required in any of these decisions. Rather, the Commission has acted as a judicial body and has neglected "to advance the interests of the public."

With respect to a different question, the Commission concluded in a 1952 decision that the applicant utility should "provide supplementary seasonal storage or standby gas production plants."[14] Fourteen months later it said: "Applicant should continue its pending negotiations to develop promptly nearby seasonal underground storage reservoirs."[15] Finally, in 1956, the Commission said that "an additional 80 million cubic feet per day is assumed as being available from underground storage starting in

[14] Decision 47492, *op. cit.*, p. 817.
[15] Decision 49101, *op. cit.*, p. 751.

1957."[16] Thus, it took the Commission five years to induce the Pacific Gas and Electric Company to provide for any underground storage reservoirs.

In another matter the Commission concluded: "The applicant's proposal to invest . . . . in the expansion of the existing Topock-Milpitas pipeline system is economically sound."[17] It authorized this expansion in spite of the fact that the company had included cost estimates for only one type of compressor and had completely ignored another type which the southern California gas companies had found was both cheaper and more efficient. In response to this failure to supply cost estimates on the cheaper compressor, the Commission did nothing. Instead, it said that the applicant should "continue to study and possibly adopt the new developments in the field of gas transmission as soon as they become practical and economically justifiable."[18]

The complaint that regulatory commissions tend to relax their regulatory function whenever they emphasize their judicial function is quite consistent with the evidence presented above. While many writers have commented about this relationship,[19] Ben Lewis very nearly asserts that it is a necessary relationship when he says that "by virtue of our centuries-old tradition which conditions the atmosphere and operations even of our administrative tribunals, the public board must be impartial, if not completely 'passive,' in its approach."[20] If it is true that emphasis of the judicial function necessarily means a relaxation of the regulatory function, then, in view of the tendency of regulatory commissions to emphasize their judicial function, there seems to be little hope that they will regulate. While available evidence does not contradict this conclusion, there is nothing which shows that "passive" regulatory behavior must necessarily follow an impartial, judicial approach.

State regulatory agencies generally must consider two classes of cases. Both in terms of time spent and in terms of their social, economic significance, the more important class deals with the whole range of regulatory functions listed at the beginning of this paper, while the less important class arises out of particular consumer complaints. The former class of cases almost exclusively involves technical questions in which testimony of expert witnesses plays an important role and, while public hearings are held in these cases, the public is essentially precluded from participating because of a lack of direct interest and a lack of technical competence. The utilities, on the other hand, have staffs of specialists who prepare their evidence and, where they do not have their own, they can hire expert consultants. Now if a regulatory commission emphasizes its judicial character, it tends to act as a judicial agency would act, which means that it hears evidence and renders a decision on the basis of it. Since most of the evidence comes from the utilities, this procedure must always result in an overwhelming advantage for the utilities as opposed to the general public.

Several proposals have been advanced for improving the regulatory effectiveness of administrative commissions but, after discussing them, Marshall Dimock concludes that "no plan holds any promise of significant improvement unless more adequate funds and staff are

[16] Decision 52436, *op. cit.*, p. 596.
[17] *Ibid.*, p. 599.
[18] *Loc. cit.*
[19] Dimock, *op. cit.*, p. 486; Fesler, *op. cit.*, p. 22.
[20] Ben W. Lewis, "The 'Consumer' and 'Public' Interests under Public Regulation," *Journal of Political Economy*, February 1938; reprinted in American Economic Association, *Readings in the Social Control of Industry*, Vol. I, edited by E. M. Hoover, Jr. and Joel Dean (Philadelphia: The Blakiston Company, 1949), p. 314.

provided."[21] In view of the fact that the California commission has both adequate funds and staff and still suffers from the weakness of the "passive approach," Marshall Dimock's conclusion also seems to hold little promise.

Significant improvement could result, however, if regulatory commissions would modify slightly their existing *modus operandi*. There is much to be said in favor of the impartiality deriving from the judicial approach. Most of the complaints voiced have arisen not from the commissions' judicial approach, but rather from their apparent disregard of the interests of the general public. As has been pointed out, because of the highly technical nature of the most important cases requiring commission decision, most, if not all, of the evidence presented supports the point of view of the utilities. It is with respect to this point that regulatory commissions might consider altering their existing procedure. If, instead of considering their task to be the passive one of simply hearing evidence that the interested parties (usually only the applicant utility) wished to present, they were to go one step further and require that all relevant evidence be presented, the burden of evidence would be removed from the general public. The sources of this additional evidence might include the applicant utility itself, the commission staff, and experts from the community, including the staffs of other utilities. This further step means that the commission could remain judicial in the sense that its decisions would be based only on the evidence, but it also means that all the relevant evidence would be considered.

If this approach had been used in the latest California gas pipe line decision,[22] it would not have been sufficient for the applicant utility to request permission to construct a 30-inch pipe line simply because it could show that the resulting cost of gas to consumers would be "just and reasonable." Instead, it would have had to show that the proposed size was the best. In this particular case, it would have had to show that the delivered cost of gas using a 30-inch line was less than the delivered cost using a 34-inch line because the commission could have called for testimony from the staff of the Pacific Gas and Electric Company which had been using a 34-inch pipe line for several years. Furthermore, the commission could have required the applicant utility to rebut the cost data appearing in Table I, above. Similarly, in the other California decisions discussed above,[23] the commission could have made better decisions and increased the protection of the general public if it had required more complete evidence.

On the basis of these observations, it is concluded that a regulatory commission can be judicial in its approach and, at the same time, demand that more complete evidence be presented before rendering its decision. The source of the additional evidence is immaterial. Both better decisions and greater protection of the public interest result when more complete evidence is required by the commission.

[21] Dimock, *op. cit.*, p. 492.

[22] Decision 53121, *op. cit.*

[23] Decision 47492, *op. cit.*; Decision 49101, *op. cit.*; Decision 52436, *op. cit.*

# Economic Activity in Small Areas

*By* MORGAN D. THOMAS*

ECONOMIC geographers have devoted a major portion of their research efforts toward analyzing the distributional patterns of economic activities. Relatively little attention has been given to *changes* in the levels and structure of economic activities.

Therefore the major objective of this paper is to contribute toward a greater understanding of these aspects. More specifically, an attempt will be made to show the interrelations and reciprocal relations which exist between changes in the levels and structure of economic activities which bring about changes in distribution patterns. Furthermore, a brief discussion will be made of the basic-nonbasic concept, input-output analysis and the coefficient of regional specialization as techniques for analyzing these patterns.

The discussion will be oriented toward an understanding of the economic activity patterns found in a county or in a small group of counties in the United States. The ideas and techniques can, however, be used for the analysis of larger or smaller areal units as well, providing suitable economic and demographic data are available. Many researchers are now concerned with anticipating future patterns of economic activities in particular regions. The following analysis should highlight some of the dynamic aspects which need to be considered in such studies.

### *Factors Which Effect Changes*

This section of the study then will analyze the nature and significance of these factors which bring about changes in the levels, types and distribution of economic activities within a county or area. Factors which induce growth, or stability or decline may originate either in the county or outside it. It is only in autarchic areas that all these factors originate from within, and today there are no high level technological economies that are completely self sufficient. It is therefore important to know the degree of interdependence which exists between the county and the rest of the state, country, and possibly the rest of the world. The greater the degree of economic dependence on outside areas the more sensitive the county will be to the influence of external factors which will bring about growth and/or decline in various economic activities in the county.

*Changes in Size.* Factors which induce size changes vary in nature. Perhaps the majority may be classified as either economic or political. It should be realized, however, that usually causal connections are complex. The actual factor which appears to be the one causing growth or decline in a particular economic activity may be economic or political but often such a factor may be the last link in a causal chain which may have been constructed of moral, ethical, and aesthetic etc., factors. For example, the recent establishment of industry in Palestine may be the result of an economic decision. However, can this decision be understood without taking into account the influence of the treatment of Jews in Germany before 1945, Jewish nationalism and the movement of Jews to Palestine in the post World War II period, the solidarity of the Jewish people, and the financial support Palestine Jews have received from American Jews, etc.?

Changes in levels of activity may result from variations in the population and

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production of goods and services. It is useful to consider factors that influence economic activities as those which affect levels of *demand* and *supply* of goods and services. Economic demand is a function of many variables such as purchasing power, spending habits, advertising, prices of various goods and services and their substitutes, changes in fashions and capital development, etc. Supply is a function of such factors as known or expected or hoped-for levels of returns on outlay during a particular period of time. Supply levels may differ quite markedly in the short- and long-run periods. It is also important to consider the nature of the goods and services supplied. This is especially important when discussing supplies of renewable and non-renewable or stock resources. The amount of ore a firm can supply to the market may be influenced by such things as the reserves of ore at its disposal, chemical and physical nature of the ore, and possibilities of joint production.

Both demand and supply levels may be influenced by similar factors. Technological advancements, and organizational improvements may help in bringing about reductions in total production costs. Often when these are passed on in the form of price reductions, supply and demand are stimulated. Of course, their effect will be conditioned by elasticity or inelasticities of demand and supply of the goods and services. Taxation, rationing, tariffs, quotas and economic sanctions are examples of other factors which influence both supply and demand. Space relationship whose effect is largely felt through its influence on transfer costs is yet another example.

*Changes in Structure.* Changes in the industrial structure are partly governed by the general factors which produce a demand for various goods and services. Often an area's industrial structure reflects the utilization and development of favorable endowments of natural and human resources. The rate of structural change is basically controlled by the actions of entrepreneurs and the speed with which they react to actual or potential changes in demand. Entrepreneurs in some parts of the country are often more enterprising than those in others, with consequent far reaching repercussions on the growth, structure and even distribution of economic activities.[1]

Because of the interdependence which exists between various economic activities, changes in the levels of activity in some industries may bring about changes in others. It is therefore, desirable to obtain as accurate a knowledge as possible of the nature and degree of interdependence between economic activities within the county studied and between them and other economic activities located outside that area.

Changes in the industrial structure may be in the direction of increased specialization or increased diversification. It is important to know the significances of such trends insofar as they have a bearing on the state of the county's economy. Will employment and income levels be affected by such changes in the industrial structure? If so, in what way?

*Changes in Distribution.* Changes which may occur in the distribution of economic activities within an area may be thought of in the following manner. *Firstly*, those which stem from variations in the size of present economic activities. *Secondly*, those changes which may be induced by the future introduction into the county of new economic activities.

Variations in the distribution pattern of economic activities are the result of

[1] Morgan D. Thomas, "Economic Geography and the Manufacturing Industry of Northern Ireland," *Economic Geography*, January 1956, pp. 84-85.

positive or negative net changes in the levels of these activities. One may then ask why do economic activity levels change within a county? They partly change as a result of the interactions of factors which influence the demand and supply of goods and services. Within the county their change is partly a measure of the enterprise of those entrepreneurs already engaged in some kind of economic activity in the area, and their rate of response to changes in demand and supply. These variations in economic activity levels also mirror changes in the favorability of the county as a location for both existing and new economic activities.

The *continued existence*[2] of an enterprise in a county will be a function of the economic efficiency of its organization, production, location and siting for these factors determine the competitive position of the enterprise. There are many factors which govern the favorability of an area's location such as the availability and cost of the right kind of labor, raw materials, capital, power, water, and transportation. Governmental influences, scale of operation and costs of moving plant or moving operations to another situation are further examples of factors which may influence the location of economic activities. The researcher should, however, realize that factors which affect the location of economic activities change in their nature and degree of influence through time and space. They also vary in their influence from one type of economic activity to another. They also rarely act singly; in other words, "no single factor can indicate a location."[3] Factors governing changes in the location of existing enterprises may well be different from those which will decide the favorability of the county as a location for new activities. Within the county there are many sites, and the combination of factors responsible for the choice of a particular *site* will usually be different from the combination of factors which influenced the choice of the county as a *location* for a particular economic activity.

Furthermore, researchers may wish to obtain an idea of levels of economic activities in a particular area for some future year. Usually these levels are projected on the basis of past levels by using various statistical techniques. However, Dr. Gerhard Colm, an eminent authority on projection techniques and their uses, stated in a recent paper, "I am skeptical of a projection which is derived simply as the result of econometric computations and which leaves no room for the exercise of judgment concerning possible changes in government measures and consumer and business behavior."[4] Those who agree with Dr. Colm would no doubt, wish to use their "judgment" and where necessary adjust the projected figures obtained by the use of econometric models. Brief consideration will now be given to: (a) some of the factors involved in making such a judgment, and (b) a few concepts and techniques which may help in the analysis of economic activity patterns and which will contribute to making "judgment" adjustments more *rational*. The present writer wishes to emphasize that the researcher's exercise of judgment will be influenced by such variables as his knowledge, wisdom, intuitive skill, his knowledge of the problem in need of solution and the county studied, as well

[2] See an interesting discussion of whether the enterprise's continuing to exist depends on its "*adaptation*" to the locational environment or its "*adoption*" by the economic system by C. M. Tiebout, "Location Theory, Empirical Evidence, and Economic Revolution," *Proceedings* of the Regional Science Association, 1957, pp. 74-86.

[3] August Lösch, *The Economics of Location* (New Haven: Yale University Press, 1954), p. 35.

[4] Gerhard Colm, "Economic Projections: Tools of Economic Analysis and Decision Making," *American Economic Review, Papers and Proceedings*, May 1958, p. 183.

as his choice of causal aspects which induce change in the level of economic activities.

*Factors Influencing Judgment.* In making more rational "judgment" adjustments to the projections it will help to obtain information about the nature and the degree of influence of factors which affect the size of existing economic activities and the interrelationships of these activities during the period studied. This will also be true of information which relates to the county's favorability as a location for the expansion of existing economic activities and as a location for new enterprises.

It is regretable that at present there are so few analytical tools which can provide insight into *the mechanism of economic change.* The few available are relatively crude and, in general, they tend to become more inefficient as one deals with smaller and smaller portions of the national economy. In addition, the weaknesses of these tools usually become increasingly obvious as one attempts to use them in dynamic situations.

Despite certain weaknesses which they possess there are a number of concepts and techniques which may be discreetly used as guidelines when making judgment or subjective adjustments to economic projections. Before discussing briefly a few of these analytical tools it must be remembered that they must not be used naively; in other words, one should know the strengths and limitations of the various concepts and techniques and the best uses to which they may be put. The following comments on these analytical tools will be confined to a discussion of their use and suitability as aids in analyzing present and estimating future economic activity patterns. First, the distributional aspects will be considered and the usefulness of the coefficient of regional specialization outlined. Secondly, the basic-nonbasic concept and the input-output model will be examined as examples of techniques which can be used in the study of the significance of levels and types of economic activities.

### *Concepts and Techniques*

*Coefficient of Regional Specialization.* A crude device for indicating an area's favorability as a location for its existing industries has been to compare local and national patterns of economic activities by means of coefficients of regional specialization. Labor or, when available, value-added coefficients may be used. The coefficient of regional specialization for each economic activity may be obtained in the following manner.

"Suppose a region (or county) "A" has a total number employed of 200,000 persons in a country which has 600,000 employed persons. In region (or county) "A" there is a textile industry employing 50,000 persons as compared to a total of 75,000 persons engaged in a country as a whole. The coefficient of regional specialization in the textile industry would in this case be:[5]

$$\frac{50{,}000}{200{,}000} \div \frac{600{,}000}{75{,}000} = 2.0$$

In this case it is assumed that region (or county) "A"'s textile industry exports the textiles produced by half its workers. In other words, it has an index of surplus workers of 25,000 persons in the textile industry . . . . It should be noted that the above index of surplus workers can only be used for intraregional (county) comparisons while the coefficient of regional specialization can be used for both intra-regional and interregional comparisons . . . . By dividing the index of surplus workers by the total regional employment it is possible to convert the index into a relative form. This ratio can then be used for inter-industry comparisons regardless of differences in export surplus employment totals."[6]

[5] This is a crude index. See J. M. Matilla and W. R. Thompson, "The Measurement of the Economic Base of the Metropolitan Area," *Land Economics*, August 1956, pp. 218-219.

[6] Thomas, *op. cit.*, pp. 87-88.

The assumptions and weaknesses of this technique have been examined elsewhere.[7] The usefulness of the coefficient as a guide to the favorability of a region or county as a location for a particular activity will greatly depend on the validity of the assumptions, in particular the following: where the region or county has a higher proportion of its total labor force engaged in all economic activities in a particular industry than the national average for the same industry, it is assumed that the region or county specializes in that industry. Furthermore, it is assumed that the region or county is an above-average favorable location for the industry. Then by checking its growth trends against national trends one may decide whether the area in question is becoming a more or a less favorable location for that industry.

It is clear that the above technique will not give any idea of how favorable the area is as a potential location for types of economic activities new to the region or county. In this connection it may be profitable to consider the use of linear programming. The problem would then be: which economic activities would be attracted to the area given its available resources and the resource requirements of various types of industries? The use of such a method of solution would not be easy in terms of work involved or information required; and also many "judgment" assumptions would have to be made.

Changes in the size and structure of economic activities in a given area can and do influence the locational attractions of that area for certain types of economic activities. It is also true that changes in the favorability of a region as a location for various economic activities often bring about changes in the levels and kinds of economic activities found there. These are reciprocal relations which we need to know more about if we are to make more rational estimates of future levels of activity. These relations and interdependences and their effects emphasize the need for the integration of theories of economic growth and structural changes, and theories which pertain to the location of all economic activities.[8]

*Basic-Nonbasic Concept.* Rutledge Vining suggests that the "export" industry provides the economic foundation for the economy.[9] If one assumes that this is true, then studies which are focussed on "export" industries should be of considerable value in the search for a greater understanding of economic activity patterns. These "exports" or "basic" industries as defined by Richard B. Andrews are "those activities of a community which involve the export of goods or services to firms or individuals who live and gain their incomes from locations outside the economic limits[10] of the community in question."[11] All other economic activities of that community will then be "nonbasic." Vining has shown that employment in nonbasic industries tends to be directly related to employment in the basic industries.[12] It

[7] *Ibid.*, p. 88. See also Morgan D. Thomas, "A Regional Model for Projecting Industrial Water Consumption," *Papers of the Michigan Academy of Science, Arts and Letters*, 1958, (1957 meeting), pp. 255-256.

[8] There is also a need to spell out "ways in which production theory and location theory may be interwoven and fused." See W. Isard, *Location and Space-Economy* (Boston, Massachusetts: The Technology Press of the Massachusetts Institute of Technology, and New York: John Wiley and Sons, Inc., 1956), p. 286.

[9] Rutledge Vining, "The Region as an Economic Entity and Certain Variations to Be Observed in the Study of Systems of Regions," *American Economic Review, Papers and Proceedings*, May 1949, p. 90.

[10] I believe "specified geographic limits" would be a better phrase than "economic limits" because the concept has validity only in a strictly defined areal context.

[11] R. B. Andrews, "Mechanics of the Urban Economic Base, A Classification of Base Types," *Land Economics*, November 1954, p. 343. Anyone interested in the economic base should read Dr. Andrews' series of twelve articles in *Land Economics*, May 1953 to February 1956.

[12] Rutledge Vining, "Location of Industry and Regional Patterns of Business Cycle Behavior," *Econometrics*, January 1946, pp. 37-68.

must be remembered however that export industries are not the only generators of economic activity in a county or region. Nevertheless, the greater the economic specialization when associated with high levels of living, the greater the importance of export industries in that area, especially if its natural resource base is narrow. In such a situation the basic-nonbasic concept increases in value as an analytical tool.[13] Most if not all counties in the United States are far from being self sufficient and it is reasonable to assume that many of these areal units are particularly suited to the use of the basic-nonbasic concept. In these counties it may be used as possibly the initial framework for analysis and so aid in the provision of useful information about the local economy.

It is true that at present the basic-nonbasic or "economic base" concept has many mechanical and conceptual weaknesses. These stem partly from the difficulties of obtaining perfect criteria for measuring the base and partly from the assumptions upon which the concept is founded. Many of the difficulties of measuring the base can be overcome by carrying out intensive field work.[14] However, this type of research requires considerable outlay of labor, time and money. "The validity of the assumptions upon which the economic base concept rests, vary considerably from region to region, and city to city [and county to county]. This means that there will be also considerable variation in the usefulness of the economic base concept from place to place . . . . Its effectiveness as an analytical tool used to study the economy of a region or [county] is influenced by such factors as the degree of self sufficiency, industrial specialization, division of labor and the cultural and technological resources and level of living of the people in a [county] . . . . as well as the population density and the amount and quality of the natural resources within the delimited area."[15]

The usefulness of the economic base as an analytical tool would be enhanced if for example we knew whether or not certain basic-nonbasic ratios could be correlated with particular economic structures. Furthermore, what connections, if any, are there between levels of activity in various types of export industries and general employment and income levels in a county? Do the ratios alter in response to changes in the size of the area's population?

The use of the economic base idea as an aid in estimating future levels of economic activity is hampered by the fact that it is a static concept. It would be of greater utility if it were possible to know how these ratios alter over time[16] in response to economic and other cultural changes. Further work on these aspects may prove to be well worth the effort.

Basic industries generate employment or income in nonbasic industries and even other basic activities through the

[13] Morgan D. Thomas, "The 'Economic Base' and a Region's Economy," *Journal of the American Institute of Planners*, Vol. XXIII, No. 2, 1957, p. 90.

[14] For examples of this kind of work, see John W. Alexander, *Oshkosh, Wisconsin, An Economic Base Study*, 1951, and *An Economic Base Study of Madison, Wisconsin*, 1953. Both monographs published by the Bureau of Business Research School of Commerce, University of Wisconsin, Madison, Wisconsin. For a counter argument, see Victor Roterus and Wesley Calef, "Notes on the Basic-Non Basic Employment Ration," *Economic Geography*, January 1955, p. 19.

[15] Thomas, "The 'Economic Base' and a Region's Economy," p. 92. See also a more detailed analysis of these mechanical and conceptual weaknesses of the concept given earlier in the same paper. For further critical comments, see Ralph W. Pfouts, "An Empirical Testing of the Economic Base Theory," *Journal of the American Institute of Planners*, Vol. XXIII, No. 2, 1957, pp. 64-69.

[16] Pfouts, *ibid.*, For a criticism of Pfouts' attempt to measure changes in the basic-nonbasic ratio over time, see Britton Harris, "Comments on Pfouts' Test of the Base Theory," See also Ralph W. Pfouts, "Reply to Harris on Testing the Base Theory," and Charles M. Tiebout, "Harris versus Pfouts: A Third Party Note." All three comments are in *Journal of the American Institute of Planners*, Vol. XXIV, No. 4, 1958.

multiplier and acceleration effects. Variations in the employment or income multipliers and /or acceleration effect will bring about changes in the basic-nonbasic ratio. Further studies of the multiplier and acceleration principle in this context would not only aid in making "judgment" adjustments to projected levels of economic activity, but they would also increase the utility of the economic base concept. One must realize, however, that the type of data required to provide worthwhile information on the local or county employment and income multipliers and acceleration effect demands intensive field work, the divulgence of necessary information (much of this will be confidential in nature) by area residents, the expenditure of much time, money and effort. Knowledge of the county multipliers and acceleration effect will help in explaining why there are variations in the rate of change of activity levels in nonbasic industries in response to changes in the size of basic industries in different areas at a point in time, and even through time.

*Input-Output.* The input-output model, first developed by Leontief,[17] has received growing attention by economists and planners especially those interested in regional economic problems. The model was first constructed to analyze certain aspects of the national economy but economists such as Isard,[18] Kuenne[19] and Walker[20] have attempted to use input-output analysis in regional studies. In a recent paper Baumol defined input-output analysis as "the attempt to take account of general equilibrium phenomena in empirical analysis of production,"[21] he also points out this analytical tool is primarily concerned with the technological aspects of production, and demand theory is of no great concern in the "hard core of input-output analysis," particularly in the case of the open model which is better suited for regional problems than the closed model. Empirical investigation is of great importance in this type of analysis. These investigations are focussed on the structural interrelationships and interdependences of the economy. Input-output models may then have some utility in providing better guidance in making subjective adjustments to projected levels of economic activitiy. As was the case with the basic-nonbasic concept, the input-output analytical tool is in need of refinement and it is founded on many assumptions which need to be improved.[22] Both are static concepts. The input-output model, however, "can be used in predicting future production requirements if usable demand estimates can somehow be obtained."[23] When we know more about changes in basic-nonbasic ratios over time we may also be able to predict future levels of activity in basic and nonbasic industries.

Tiebout in a recent paper[24] has shown that conceptually there is little difference

[17] W. W. Leontief, *The Structure of American Economy, 1919-1939*, 2nd ed., revised (New York: Oxford University Press, 1951).

[18] W. Isard, "Interregional and Regional Input-output Analysis: A Model of Space-Economy," *Review of Economics and Statistics*, November 1951, pp. 318-328.

[19] R. E. Kuenne, *The Use of Input-Output Techniques for the Estimation of Employment in the Delaware Valley*, Doctoral dissertation, Harvard University Archives, Cambridge, Mass., 1953.

[20] F. V. Walker, "Projection of the Gulf Coast Regional Output," *Proceedings* of the Regional Science Association, 1957, pp. 266-284.

[21] W. J. Baumol, "Activity Analysis in One Lesson," *The American Economic Review*, December 1958, p. 853.

[22] *Ibid.*, pp. 854-857. See also, R. Dorfmen, P. A. Samuelson and R. M. Solow, *Linear Programming and Economic Analysis* (New York: McGraw-Hill Book Company, 1958), especially chapters 9 and 10. Note how the authors attempt to create a dynamic model and link it up with the theory of capital in chapters 11 and 12.

[23] Baumol, *op. cit.*, p. 854. This is done by Walker in his study mentioned earlier in this paper.

[24] C. M. Tiebout, "Input-output and Foreign Trade Multiplier Models in Urban Research," *Journal of the American Institute of Planners*, Vol. XXIII, No. 3, 1957, pp. 126-130.

between the economic base, input-output and foreign trade models. They are, however, different in their emphasis. In counties or regions that have little if any economic activity generated by the sale of goods and services *within* the area the economic base model because of its emphasis on the export industries should be of great utility. The input-output model with its emphasis on technical coefficients theoretically increases in value as an analytical tool in a county or region as the degree of industrial diversification and self sufficiency increases, which means a greater number of industries will have to be considered. In sparsely populated counties and regions this may not be a serious problem in terms of calculations necessary for insertion in the model. The situation will be very different in more complex economic areas with large populations. Obtaining the necessary detailed information will be very difficult. Furthermore, Baumol points out that "the number of required pieces of statistical information increases as the square of the number of industries considered . . . . [and] the number of computation steps involved in solving the equations increases approximately as the cube of the number of industries."[25]

Until the late 1940's spatial aspects of economic activities had received relatively little serious analytical scrutiny—more emphasis had been given to descriptive aspects. Good description, however, must preceed good analysis; yet one must admit that even in 1960 the very few so-called theories of industrial location are weak and inadequate. Furthermore, attention in such theories is primarily focussed on the locating of manufacturing activities and usually "to the point of view of the firm."[26]

[25] Baumol, *op. cit.*, pp. 856-857.
[26] Lösch, *op. cit.*, p. 92.

### *Conclusions*

When studying patterns of economic activities it is useful to think of such patterns as being composed of three integral parts; size, structure and distribution. The many factors which influence the levels, types and distributtions of economic activities are dynamic and vary in their degree of influence through time and space. Furthermore, Kuznets[27] and Lewis[28] and others have pointed out that changes in economic activity patterns cannot be explained solely by economic factors. Therefore, a search for an explanation and understanding of how and why any pattern of economic activity comes into being or changes—requires also the search for and analysis of not only economic but other relevant causal factors. The focussing of attention on these causal aspects is of prime importance in facilitating the applied functions of economics and economic geography. The discovering of causes of a particular pattern of economic activities is necessary in order to discover what needs to be altered, if there is a need to produce, prevent or counteract it. The refinement of existing ideas and analytical tools such as the basic-nonbasic concept, input-output model and coefficient of regional specialization, and the development of new concepts and techniques is necessary if we are to achieve necessary insights into the patterns of economic activities we study.[29] This is also true if we are to make more rational estimates of expected or desirable future patterns.

[27] S. Kuznets, *Economic Change* (New York: W. W. Norton and Company Inc., 1953).
[28] W. A. Lewis, *The Theory of Economic Growth* (London, England: George Allen and Unwin Ltd., 1955.)
[29] Examples of other analytical tools which may be used for this purpose include small area balance of payments analysis, commodity and income flow analysis, industrial complex analysis, multiplier and accelerator analysis.

# Agriculture and the Development of Tropical Africa

*By* EDWARD MARCUS*

IN any development plan for the countries of Tropical Africa[1] agriculture must be accorded a leading role. One obvious reason is the predominance of the rural segment, even in those countries with rich mineral resources. More important, an increase in agricultural production could be the quickest and perhaps cheapest means of providing the necessary surplus resources to fuel the accompanying projects for industrialization; exports can be stepped up in payment for capital goods required from abroad; labor can be diverted to the new industries if the peasant sector intensifies its use of the now more productive land; and markets for local manufactures can thrive as salable surpluses are exchanged for the urban centers' fabricated commodities.

Unlike so much of Asia, African agriculture has two paths along which its output might be expanded—more production per worker and more acres farmed by more people. Productivity is low—only the Far East has a lower output per head of population—and there is still much land that can be cultivated, so that either or both approaches are feasible for most countries in the region. The former is the more desirable since it would not draw on the surplus labor pool. New industries could funnel it off.

Yet it is open to question whether Tropical Africa can look to agriculture to spark its development—to create the "take-off" into a cumulatively progressing stage as is implied by its more ardent advocates.[2] In fact, the obstacles are such that it is doubtful whether a sharp break with past growth rates can be expected unless changes are first instituted in other parts of the economy. At best, the probable step-up in output might be enough to offset the population increase and greater urbanization and even this limited improvement will probably require government intervention to spur the private cultivator.

Furthermore, considering the low elasticities of demand that characterize the market for agricultural products, it is even questionable economics to expend too much on the expansion of cash (that is, marketable) crops. The increase in production of subsistence crops—those that will directly raise the grower's own intake—will automatically find its own demand. But wherever the end result is to throw more on to the market, a possible decline in prices might impair the profitability of the investment.

Of course, the population growth of the world—including Africa—will also be expanding demand. Since the area has a net annual increase in population second only to Latin America, it is possible that the efforts to expand production will be matched by a sufficient growth in consumers to absorb the added supplies without disturbance of the price structure. This possibility would be most likely for products consumed within Tropical Africa, such as foodstuffs. Export-oriented commodities—cocoa and groundnuts, for example—would be dependent upon world demand and adverse price reactions

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[1] The area south of the Sahara Desert and north of the "white belt" of Southern Rhodesia and South Africa. "SubSahara" would include both "Tropical Africa" and the aforementioned "white belt."

[2] W. W. Rostow, "The Take-Off into Self-Sustained Growth," *Economic Journal*, March 1956; and W. A. Lewis, *Report on Industralization and the Gold Coast* (Accra, Africa: Government Printing Office, 1953), p. 2, par. 22.

would be a greater risk. This vulnerability is heightened by the predominance of the industrial countries as consumers, with their research for synthetics and other substitutes a constant threat.

It is easy to see why agriculture cannot be slighted in any practical development program. Africa's most populous country, Nigeria, is overwhelmingly a producer of farm products; about two-thirds of its gross national product (GNP) can be attributed to this sector, which also serves as the main source of exports, some 25 percent of output going abroad. Four products—cocoa, ground nuts, palm kernels and palm oil—account for 60 percent of exports. In Tanganyika a similar calculation gives agriculture a 48 percent share of GNP with an additional 13 percent for livestock, forestry, hunting and fishing; sisal, coffee and cotton account for more than half of all exports. Even in the minerals-rich Belgian Congo agriculture is the source of more than half the income of the indigenous population and contributes a quarter more than do mineral resources to GNP.

Usually the local industries which are established first in a developing economy are those that process home-grown products. Essentially much of the early stage of the economic transformation is agriculture-oriented. The presence of ample palm oil supplies has resulted in the establishment of margarine factories in the Belgian Congo, whereas in Nigeria it was a lack of raw materials that defeated the attempt to establish a bag industry despite a promising sales picture.[3]

It would be a mistake to think that the efforts that brought a high standard of living to an agricultural country like New Zealand could be carried over to Tropical Africa with the expectation of achieving a similar success. The soil is much poorer, erosion is a constant threat, and the native farmer is extremely inefficient. The African's agricultural methods are reminiscent of the Middle Ages. The opposition of ignorance and custom to the introduction of new systems of cultivation is so great that it is doubtful whether the rural African has really been touched by the twentieth century spirit, in contrast to the favorable response to industrialization shown by his urban cousins.

Probably the most serious impediment to agricultural developments is the poor quality of so much African soil. Most foreigners envision the land as a lush combination of tropical jungle and verdant fields, but actual experience reveals that much of the acreage is poor, eroded, or not economically fit for cultivation. There is a widespread deficiency in plant nutrients and in such regions crops fed to animals result in manure of little value. One estimate places at 10 percent the proportion of the land that can be cultivated without particular precautions while much of the remainder is good only for intermittent pasturage.[4] Low as is the present fertility, there are indications that it is declining even further. Since 1955-56 agricultural per capita output has leveled off with a slight slowing down in the rate of increase in aggregate production. In Ghana, for example, the post-World-War-II inflation failed to stimulate output appreciably.

Over much of the area the African practices a shifting cultivation—the rotation of fields rather than of crops. For most of the tropical soils it is necessary to keep the land under bush fallow or grass leys for long periods in order to maintain fertility. In the northern part of Northern Rhodesia, for example, the

[3] F. J. Pedler, *Economic Geography of West Africa* (London: Longmans, Green & Co., 1955), p. 87.

[4] South African Institute of International Affairs, *Africa South of the Sahara* (Cape Town: Oxford University Press, 1951), p. xx.

virgin soils have a high humus content but cultivation exhausts them rapidly. The burning of the forests that is a characteristic of the native method of clearing the land has destroyed the soil's protective cover, threatening both the soil and water resources since a third to a half of the land should be kept under forest to prevent this danger.

The climatic extremes of the tropics are another major cause of the seriousness of the erosion problem. The rains are so heavy that much of the soil is washed away; when the rains stop the soil may harden and make cultivation exceedingly difficult. In the district of Agulu in Eastern Nigeria a gully was reported covering more than a square mile with a vertical profile of more than 500 feet; this was quadruple its extent in 1952, six years before.

The expansion of population and thus intensification of use have increased this erosion danger markedly. Where the practice of a shifting cultivation prevails, the amount of land that can be left idle is a function of the number who must secure a living from the soil. If the tribe is small—10 persons per square mile is above average density in many regions—tilling a few acres is sufficient and the remainder can be left idle for long periods. As the population increases, more acres must be under cultivation at any one time and fewer acres can be left idle. The same acre which may have been used once in five years when the population was low now may be cultivated every third, or even every second year—thereby causing the gradual depletion of its quality as the rate of use speeds up.

Moreover, the typical African is not "water conscious" and fails to make the best use of this resource. Much could be accomplished by simple hydraulic projects such as the digging of wells and tanks and the construction of small dams; this has been particularly successful in French Africa, thanks to the efforts of the government.[5] On the other hand, the underground water supply is neither easy to get at nor sufficiently regular in supply, and the continent cannot be considered well-watered. Water is scanty in at least three-fourths the SubSaharan region and the rainy seasons often cause the silting of reservoirs. The seasonal character of the rainfalls also means that the waterways are rarely perennial.

The prospects for mechanization are not encouraging. Where native labor is as cheap as in most of Africa no rational accounting could justify its replacement by investing in equipment that uses up the scanty supplies of available capital. At this stage it is more likely that machine techniques would be adopted by postcultural operations.[6]

Moreover, there are technical considerations that impede the use of modern agricultural machinery. Mechanized clearing, for example, is difficult. The rock fragments in so much of the African soil prevent the employment of most of the heavy items such as the caterpillar tractor; its use would simply pound the soil into a hard macadam layer. In fact, it is even questionable whether plowing in such areas is the best method since such a practice might cause the rapid oxidation of the organic matter on exposure to the tropical temperatures. It is unusual for a large area to have the uniform economic, ecological and biological characteristics necessary for mechanization and farms are widely scattered over suitable tracts; this terrain difficulty was overlooked in the planning of the East African Groundnut Scheme.

[5] The Ambassade de France Service de Presse et d'Information, *African Affairs*, October 1956, p. 11.

[6] G. B. Stapleton, *The Wealth of Nigeria* (London: Oxford University Press, 1958), pp. 143-144.

Quality improvement of the existing crops also has been suggested as a quick aid for rural well-being. The Nigerian peasant compares most unfavorably with his Dutch East Indies counterpart; palm oil cultivation in Indonesia yields less than a 2 percent free fatty acid content[7] whereas in Nigeria the final product contains as much as 17 percent.

Product upgrading is neither as simple nor as obvious a solution as it appears. The educational problems, often involving completely new techniques of cultivation, are enormous in themselves. In addition, such an attempt would require both the research to achieve this improved care and also an inspection system to assure that the final products did meet the market requirements for the better grade. The added gross income from the better quality strains is thus partially offset by extra costs—research and education, inspectors, the added labor in the field, etc., not to mention the depressing effect on the price of the new grade as its particular supply is increased. The long period before better application of these improved methods upgrades the quality and money return is beyond the African's time-preference horizon nor does he have the capital to carry him over the waiting period. Often he is forced to borrow to get through until the harvest, usually at usurious rates as high as 100 percent per annum.

Moreover, there is always the possibility that such an effort will tend to concentrate the producers exclusively on the superior grades thus limiting the crop's potential market. After all, there is often a demand for the poorer grades, too. Nigerian cotton, for example, is too good in quality for the cheap cloth that the local African populace desires; as a result local manufacturing using home-grown raw materials for the native market is impeded. Furthermore, the market may not return enough to reflect the quality difference; cocoa manufacturers, for example, tend to pay the same price for the two best grades of cocoa.[8]

So far, productivity improvement has been in terms of the existing crop pattern but there is also a startling lack of knowledge about the profitability of alternative crops. In particular, many believe that wet rice would be a desirable addition since it can be grown continuously, whereas roots, maize, and most other crops can be grown in high rainfall regions on the average for only one out of three to five years without serious risk of hurting the soil. Wet rice yields a greater amount per labor hour, so much so that it has been labeled "the glamor crop of West Africa."[9] Of course there is the problem of native hostility to change. The educational process is long and costly and may not ever succeed unless assisted by more direct methods. Some countries have introduced compulsory quotas to stimulate the production or changeover to the desired crop.

This need for a new or different crop is most evident in the one-crop countries. The evils of exclusive dependence on a sole source of income and its predominance in exports means that both the business cycle and the state of the country's balance of international payments are at the mercy of some one segment overseas. Ghana, with its reliance on cocoa, must vary precariously with the chocolate-eating habits of the Western World and the possible expansion of production in other countries, e.g., Brazil,

[7] Free fatty acid content is an inverse measure of quality.

[8] F. J. Pedler, *op. cit.*, pp. 83, 87.

[9] B. F. Johnston, *The Staple Food Economies of Western Tropical Africa* (Stanford: Stanford University Press, 1958), pp. 124, 128, 225-242. If the Volta River aluminum project in Ghana is ever accomplished rice would become important in the Accra Plains. It can also be grown successfully on the reclaimed swamps of the South Chilwa plain, Nyasaland.

Nigeria, and French West Africa. Her internal well-being can be read in the shifts in the world price and competitive situation of that one raw material as well as the success in combating the "swollen shoot" disease.

The introduction of a new crop usually is designed for local consumption. Rice (mentioned previously) would either replace or supplement existing dietary patterns rather than add to exports. Thus, the necessary condition for such a possibility is acceptance of this new item by both the producers and consumers. Although people are conservative regarding innovations in their eating habits, it appears that urbanization in Africa does tend to increase the willingness of the native to change his diet. The city dweller, because his shift in locale has already uprooted some of his customary ways, has unconsciously created the necessary frame of mind for such a change. After a while, as a result of the daily contacts through trade, the rural element bordering the city is then likely to imitate the more sophisticated urbanites, thus enlarging the area wherein the changing consumption components register. [10]

It should be noted that the climatic and soil conditions for the new crop may differ markedly from the existing ones so that the individual farmers may still be specialized although the country's overall diversity has improved. Where previously the farmers were growing only cocoa, some now grow only cocoa and others grow only rice. The fortunes of each segment are still tied to some one market—abroad for cocoa, the nearby cities for rice—and thus each still faces an uncertain world. But the economy as a whole is more stabilized since its components are no longer tied to the same external variable.

If, however, the same farmer can now produce a more diversified output, the cyclical changes spread the degree of instability more widely but less intensively. Previously, the cocoa farmer felt the brunt of any overseas change in demand; his income responded exclusively to its shifts. Now, however, the export crop furnishes only a portion of his total income so that its fluctuations affect his total income by a smaller percentage—smaller to the extent that his other crops are unaffected. As a result, a decline in the export sphere would curtail his income proportionately less, and induce a smaller cutback in his spending. This, in turn, would result in a smaller decline in sales to the rural community by the local merchants.

One possible agricultural policy often suggested is a shift from subsistence farming to the raising of cash crops. Tropical Africa may well be at the stage where the produce of the underdeveloped hinterland is needed for the consumption of the non-agricultural (internal) markets arising from the post-World War II expansion. Thanks to rations in kind and cash wages there has been an increase in the real standard of living for the urban dwellers. Alternatively, additional output could be exported to bring in more foreign exchange which could be used to pay for increased imports of capital or consumer's goods. This change would introduce the farmer to the money economy and at the same time expand the internal market for city-supplied goods and services. The farmer's new source of cash income plus his contact with the more progressive sectors of the economy would also acquaint him with new wants and commodities.

If the subsistence farmer changed over completely to a cash crop he would give

[10] In Conakry, the capital of Guinea, this imitation by the native has resulted in a preference for imported wheat at the expense of the previously consumed homegrown products, thus putting a strain on the country's balance of international payments.

up the security of satisfying his minimum wants and become dependent on the vagaries of the world market. When, however, the cash crop is only a supplemental source of income and he still can provide his own food, the price fluctuations do not endanger his existence but only augment or decrease his added cash income. Retention of the subsistence portion also assures a refuge in times of economic crisis such as appeared in the nineteen-thirties.

Usually such a change comes about only if world prices for the cash crops are favorable. This has been particularly noticeable in coffee production in Uganda since 1945. High coffee prices induced a rapid expansion of its cultivation along the northern shores of Lake Victoria; maize prices, in contrast, lagged, especially after 1953, and its output actually declined.[11] It should be noted that any price influence is beyond the control of the local African governments, so that the response of the natives to this influence would be correlated with world demand and supply conditions rather than with local needs for added foodstuffs and exportable surpluses. Crop rotation has been neglected in some areas, especially where the alternative was not commercially salable, thus, in effect, mining the soil.

In all the foregoing suggested developmental possibilities one fundamental obstacle must not be forgotten: custom. It opposes one of the simplest and least expensive ways of increasing output—harder work. Under the present conditions of cultivation, production per acre tends to vary with labor per acre; hence, there is still considerable scope for intensifying farming by increasing the hours worked per day or the days worked per year. Any visitor to rural Africa cannot help but be struck by the vast amount of voluntary idleness and under-employment—absenteeism and "soldiering" on the job. Work habits are slovenly and irregular, more compatible with a hunting economy. In fact, if it were not for the women who, in many African communities, are responsible for all farm work except the original land clearing, it is doubtful if the present population would raise enough food to survive.

The productivity of the native African farmer is not only low but appears to be very slow in its response to modern techniques and education. An investigatory commission in Uganda, the most African of the British East African territories, reported that "by and large the impact of Western civilization has failed to induce a new outlook towards efficiency and productivity; the changes which have taken place in the last half century, although in many ways they can be regarded as spectacular, are only superficial, and traditional attitudes and behaviour in the rural areas are still a major obstacle in the way of technological change.[12] This poor performance record, of course, only reflects the generally low level of productivity characteristic of the area in general; relative to the other activities there may be small difference between per capita output in agriculture and the other trades so that occupational shifts might not help raise over-all production noticeably.

Land tenure difficulties also present problems peculiar to the African society. In much of Tropical Africa, especially in the West, it is practically impossible for a foreigner to acquire land, and even leasing for long-term periods is not looked upon too kindly. This hostility arises in part from a fear that alienation

[11] Data in East African High Commission Statistical Department, *Quarterly Economic and Statistical Bulletin*, No. 44, June 1959, tables J. 12 and J. 13.

[12] Uganda Protectorate, *Report of the Agricultural Productivity Committee* (Entebbe 1954), p. 30.

of the land would lead to political and economic domination by the foreigner and the experiences in the "White Highlands" of Kenya and in parts of Southern Rhodesia and the Union of South Africa have reinforced this attitude. The suspicion is directed against the spectre of a nation of white entrepreneurial farmers supported by a landless class of native plantation laborers. It is true that private ownership, if unrestricted, could lead to control by money lenders and speculators.

In part, too, there is the tribal tradition that does not share the occidental views regarding ownership and its privileges. Ownership implies the freedom to do with the land as you wish and this could be contrary to that willed by the gods, guardian spirits, or the departed. Instead, land use tends to take on a collective aspect with either the tribe or the family as the operating unit. Often the individual cultivator is uncertain of his tenure and thus may not reap the rewards of any enterprise he showed in the management of his holding; the more aggressive farmer is thus held back by the dislike and jealousy of his less successful compatriots.[13]

Yet it is probable that the only means of obtaining the necessary agricultural efficiency at present is through large-scale plantation culture. Whether the African opposition is to the plantation or only to foreign-owned farms is not quite clear; in Nigeria, for example, there are signs of a change favoring plantations. The United Africa Company, Unilever's giant trading subsidiary, has summed up the case for the plantation succinctly:[14] it permits a better controlled supervision of the products; it facilitates orderly planting, systematic harvesting, and the use of fertilizers; it allows for economic transport to the processing centers and a regularity of supply, thus justifying specialized equipment; waste products can be utilized; and research can be instituted economically. Moreover, because of the long gestation period—often up to ten years from initiation to payoff for many tropical products[15]—only large-scale operation can afford to take such risks and finance such a waiting period. Obviously, the typical African cannot afford to wait, either to experiment with new crops or different strains.

The generally pessimistic tone of the discussion thus far is not meant to imply that there is no possible hope for progress in the African agricultural sector. There are approaches that can work even within the present framework of custom and the limitations of the native's income. In general, however, it is the government that will have to provide the initiative, for the rural African, because of his adherence to tradition, is not likely to try new ways on his own.

One governmental approach which recognizes the need for outside direction is the paysannat system, such as in the Belgian Congo. Here carefully selected groups of African farmers work pilot projects in the area. The farmers-to-be are settled on the best soils in the region under skilled supervision using crop rotation rather than shifting cultivation. Each such project is multiple, consisting of annual crops, large and small livestock,

[13] G. B. Masefield, "Farming Systems and Land Tenure," *Journal of African Administration*, October 1952 supplement on "Land Tenure," recounts an incident in Northern Nigeria when large areas had been invaded by a deleterious weed; this could have been eradicated easily by hand but nobody bothered because as soon as any improvement occurred all the neighbors' cattle flocked in and ate the good grass remaining with full freedom, since grazing rights were held communally. Hence the government had to step in with more expensive mechanical spraying.

[14] United Africa Company, *Statistical and Economic Review*, March 1952, pp. 3-4.

[15] This period varies, of course. For robusta coffee the estimate is as low as four or five years, whereas for rubber, palm oil, and arabica coffee it is at least eight years.

food crops, afforestation, and perennials. Farming is done either individually or collectively, depending on the tribal organization. Somewhat analogous approaches appear to have been successful in other areas, such as in French West Africa, Nigeria, and Northern Rhodesia.

The government has to be the logical body to undertake experiments leading to the introduction of new crops where the long gestation period precludes the individual farmers from such attempts. Experimental stations can be established in the different soil areas to test the feasibility of new products and cultivation methods and to conduct soil and climate studies and quality improvement. Successful approaches would then have to be sold to the individual peasants.

Although the suggestion of an alternative or new crop has been made in this paper it is also possible that the greater employment of livestock would serve the same purpose. The larger animals, such as cattle, could serve to raise local output by providing both additional brute power to supplement that of the farmer and the manure that could be used to fertilize his land. Even now it is doubtful if the farmers utilize their animals' strength adequately. While the tsetse fly is a serious hindrance to the introduction of cattle in many areas, other animals, such as the pig, can often survive—though the religious scruples of the Moslem African might limit this possibility. In addition, their sale as meat would produce an additional income. An educational process would be required to teach the African that meat quality is as important as its quantity. Anyone who has seen the Masai herds in British East Africa can well understand the problem of too many scrawny cattle overgrazing the land. By reducing their number and improving the herd's quality a sharp increase in economic value as well as a lower incidence of disease would result. Under present conditions the cows often do not even produce enough milk to feed their calves.[16]

There is also the possibility of obtaining some of the advantages of large-scale operation through peasant cooperation. This would be especially true if economy would result from a large-scale single operation, such as the preparation of land for cultivation. Here too the government could play a definite role, inducing the desired cooperation through the supplying of equipment for clearing the land, an investment beyond the means of the local farmers. So far, however, the African has not displayed any notable eagerness for such voluntary cooperation and probably only government aid and leadership could spark such a movement. One exception, it should be remarked, is the Chagga coffee growers near Moshi, Tanganyika.

If the individual's output cannot be increased appreciably, can the alternative —more farmers on more acres—serve as a source of sufficient additions to the food supply? Where unutilized land is available, more extensive cultivation is possible. The African will respond to favorable prices, especially if his cash income can be spent on commodities instead of accumulating as so much paper. Where there are plentiful supplies of consumer's goods available the expansionary incentive is most evident.

The expansion of the cultivated area, however, is less efficient than raising the per capita productivity since the latter adds to the total volume of goods without drawing on additional manpower. The resort to more extensive cultivation drains the available labor supply that

[16] Another promising possibility for additional food is fishing, although more than the average introductory vocational training would be required. In particular, to save on costly transport charges, the dried fish trade could be encouraged.

could otherwise go to the infant industries whose stimulus is the fundamental objective of development. It is also probable that there is a smaller addition to the volume of salable goods since the additional farmers would consume most of their own output. In contrast, an improvement in per capita efficiency would put most of the increase onto the market. Whatever added consumption this group enjoyed would be through the purchase of items supplied in exchange by the urban-commercial sector—bicycles, shoes, radios, etc.—thus serving to quicken the entire economy's pace.

These new farmers would be in need of some training. While agriculture does not call for the advanced skills required in manufacturing, it does require more know-how than the native lore that is picked up from the tribe. More important, it calls for more regular work habits if the new farmer is cultivating his own plot rather than the haphazard approach characteristic of communal living. The cultivator must now rely more on his own initiative and face alone the day-to-day operational problems. If, in addition, he is introduced to some of the modern-day tools and farming methods, his educational needs are augmented.

The expansion of the cultivable area would require an extension of the transport network to bring the crops to the trading centers. In Nigeria in 1958, with a groundnut crop well above average, transport shortages prevented the marketing of a third of the yield by the end of the crop season. More generally, since most of the countries produce bulky primary products, port facilities and their improvement become of prime importance for export marketing. Delays in "turn-around time" add still further to costs.[17]

*To summarize,* it would seem that the possibilities for improvement in the productivity of Tropical African agriculture is very limited. There is no apparent likelihood that future growth rates will differ sharply from the recent past so that we could look to it as the catalyst to spark a rapid rate of internal economic improvement. At best there is the hope of somewhat higher consumption levels and perhaps a contribution to exports which would help to pay for the necessary imports that must accompany any industrialization drive. Moreover, even this limited contribution would have to be aided by deliberate government efforts; it is doubtful whether the African farmer, left on his own, would change his ways so as to step up his output. Hence, any successful development plan must make provision for some material aid to the rural sector and must divert part of the technical resources and know-how to this basic industry.

[17] For a discussion of African port delays, see the United Africa Company, *Statistical and Economical Review,* March 1957, pp. 16 ff.

# Reports and Comments

## An Economic Analysis of *Property Values and Race* (Laurenti)

DO property-prices fall when nonwhites move into a neighborhood? Probably no other question concerning real estate has created so much controversy or played such an important a role in determining the ethnic ecology of our cities. Yet objective evidence about the answer has been so scarce that the controversy has consisted mostly of hearsay, opinions, and prejudices rather than facts. But now The Commission on Race and Housing has sponsored a study in which a mass of data has been gathered and analyzed by Luigi Laurenti and set forth in a new book entitled, *Property Values and Race*.[1] Because this study is the most comprehensive, thorough, and scientific analysis ever made concerning the impact of race upon sales prices of property, it deserves careful evaluation by appraisers, brokers, and everyone else concerned with real estate.

The study's major conclusion can be stated as follows: when nonwhites enter a previously all-white neighborhood consisting primarily of single-family residences, and no other changes in neighborhood character occur, then prices of residential property in the area will probably not decline and may very well rise in comparison with prices in similar neighborhoods that have remained all-white.[2] In other words, nonwhite entry alone—as distinguished from such changes in physical use as increased density—rarely causes residential property to fall in price, and quite often causes it to rise.

This conclusion is so directly opposite to traditional opinions that it deserves extremely careful analysis. Therefore we shall examine at some length the methods used to derive this result in order to discover whether they are truly valid. Then we shall discuss the study's limitations and its implications for all cities.

*The Methodology.* Although the subtitle of Laurenti's work is, "Studies in Seven Cities," its real meat is an analysis of neighborhoods in San Francisco, Oakland, and Philadelphia. In order to isolate the influence of nonwhite entry upon prices of property, he chose twenty neighborhoods in which entry had occurred at some time during the past fifteen years and compared price movements in each one with price movements in one or more similar neighborhoods which had remained all white. Nineteen such "control" neighborhoods were used, but some were compared with more than one "test" neighborhood. Thus a total of thirty-four comparisons was made. In each one the two areas being compared were similar in size, reputation, type and price of homes, and character of residents; hence the only major difference between them was the entry of nonwhites into the "test" neighborhood.

For each area Laurenti obtained the sales prices of as many transactions as possible for the six-year period from mid-1949 to mid-1955. In San Francisco and Oakland these prices were procured from multiple-listing services; in Philadelphia they were provided by real estate directories. Over 9,700 sales prices were analyzed—a total comprising about 40 percent of all sales during the six-year study period in the areas considered.

Two methods of comparison between prices in the paired neighborhoods were employed. Where properties in both areas had very similar prices and price ranges within each area were not large, average sales prices for each quarter were compared directly. When these conditions did not apply,

[1] Luigi Laurenti, *Property Values and Race* (Berkeley: University of California Press, 1960), xix plus 256 p., $6.00. Although Laurenti uses the term *value* as equivalent to *price* I have retained the traditional distinction in this review article. Therefore, since his study concerns sales *prices* of properties, I use the term *price* in many places where he refers to *value*.

[2] In the areas studied by Laurenti, 95 percent to 100 percent of the nonwhites were Negroes and almost all the whites were Caucasians.

quarterly comparisons were made of the average ratio of prices to 1950 assessed values. In either case the end result was a series of quarterly averages for each neighborhood, which was then graphed and analyzed numerically.

The most significant results of this analysis are derived from the ratio of test-area prices to control-area prices, which was computed both before and after nonwhite entry into each test area. Changes in this ratio serve as indicators of the effect of nonwhite entry on property prices. For example, assume that two areas are being compared: Area T (the test area), into which nonwhites entered in 1951, and Area C (the control area), which is still 100 percent white. Sale prices in Area T for the pre-entry period (from the beginning of the study in 1949 until entry in 1951) averaged $8,000, whereas sales prices in Area C during the same period averaged $10,000. Thus the pre-entry ratio of test prices to control prices is .80. But for the four quarters immediately preceding the end of the study, prices averaged $9,900 in Area T and $11,000 in Area C—a ratio of .90. Thus the ratio rose .10 over the period, which is equal to 12.5 percent of its original level (.80). It is this percentage change in the test-price/control-price ratio (12.5 percent in the example) which is used to indicate the impact of nonwhite entry on prices. Whenever the ratio rises or falls by 5 percent or less after nonwhite entry the impact is considered insignificant. If the ratio increases by more than 5 percent, the relative gain of test prices over control prices implies that nonwhite entry increased property prices. If the ratio falls by more than 5 percent, the relative loss of test prices compared to control prices implies that nonwhite entry decreased property prices. This methodological description may seem unduly detailed but such detail is necessary for a full understanding of Laurenti's results.[3]

However, before we examine those results, one significant limitation of the study should be mentioned. Almost all of the neighborhoods selected consisted primarily of single-family residences occupied solely by their owners. This was true both before and after nonwhite entry. Furthermore, most of the test neighborhoods were not contiguous to other areas of nonwhite population. Some were as far as two miles from the nearest nonwhite resident when entry first occurred. These characteristics make the test neighborhoods quite different from areas of racial transition in cities such as Chicago and New York, where nonwhite entry usually occurs on the periphery of neighborhoods already heavily nonwhite, and often involves significant increases in population density. Thus the conclusions derived from Laurenti's study cannot be directly applied to transition in all other cities—a fact he himself recognizes.

Nevertheless, granted this limitation—the import of which we will discuss later—it is hard to imagine a better-designed or more scientifically-conducted study than *Property Values and Race*. A great many neighborhoods are considered, control comparisons are made throughout, the sample studied includes almost half of all the sales that occurred during the test period, and the analysis is thorough and objective. Even the effects upon prices of differences in financing between white and nonwhite buyers are proved to be irrelevant by a careful subsidiary study. In my opinion, the methodology is so well constructed and well applied that the conclusions cannot be challenged as resulting from either insufficient data or misinterpretation of evidence.

*The Results.* As noted above, the study's most significant results consist of changes in the ratio of test-area prices to control-area prices for each paired comparison over the period of nonwhite entry. These changes, which reflect gains and losses of test-area prices relative to control-area prices, are summarized (for all neighborhoods) in the following table:

This table indicates that *in almost half of the price-comparisons made, prices in the racially-mixed neighborhood increased significantly, relative to those in the all-white neighborhood.* Positive changes in the test-price/control-price ratio ranged from 5.1 percent to 26.3 percent and averaged 11.7 percent. In 38.3 percent of the comparisons, no significant change in the ratio was observed. *Thus in only one out of seven cases was nonwhite entry followed by a significant decline in test-area prices relative to control-area prices.* These declines ranged from 5.1 percent to 9.1 percent and averaged 6.7 percent.

[3] These percentages differ slightly from those given by Laurenti on page 51 because I believe his figures are in error. His error understates the upward influence of nonwhite entry on prices.

| City | Number of Comparisons | Comparisons With No Significant Change In Price Ratio | Comparisons Which Show Relative Gain For Test-Area Prices | Comparisons Which Show Relative Loss For Test-Area Prices |
|---|---|---|---|---|
| San Francisco | 14 | 7 | 4 | 3 |
| Oakland | 17 | 5 | 10 | 2 |
| Philadelphia | 3 | 1 | 2 | 0 |
| TOTAL | 34 | 13 | 16 | 5 |
| Total percent[1] | 100.0% | 38.3% | 47.0% | 14.7% |

It is true that erratic price-movements in many areas caused enormous short-run variations in the key ratio. Test prices sometimes zoomed far above control prices or vice versa during one quarter, only to plunge far below shortly thereafter. Thus it might be argued that comparing the ratio before and after entry is an arbitrary process with results dependent upon what moment after entry is selected for matching with the pre-entry period. However, Laurenti based his post-entry comparison upon a four-quarter period precisely to avoid biases caused by very short-run fluctuations. Furthermore, the analysis was cut off at the same moment (mid-1955) in all areas; therefore random influences on prices should cancel out over all 34 comparisons, leaving a basic pattern embodying the effects of nonwhite entry.[4] These effects contradict the prevailing opinions of most citizens to a startling degree. Specifically, Laurenti's results imply the following conclusions:

(1) There is no single invariable effect of nonwhite entry upon prices of property. Therefore it is completely false to say that nonwhite entry always causes residential property to decline in price.
(2) Nonwhite entry caused property values to rise much more often than it caused them to fall. Sales prices in test areas increased relative to those in control areas 3.5 times as often as they decreased. Furthermore, the degree of increase was significantly larger than the degree of decrease.[5]
(3) Whether prices of property in transition areas will increase or decrease relative to those in all-white areas does not depend upon the magnitude of the nonwhite influx. When the study ended, the population in Laurenti's test neighborhoods ranged from 3 percent to 75 percent nonwhite but there was no apparent correlation between the percentage of nonwhites and changes in property prices.

*Why Prices Did Not Fall.* Since the purpose of Laurenti's study is simply to present the facts, he does not attempt to explain in detail why his results are so different from prevailing beliefs. However, the evidence he amasses points to certain basic causes of this discrepancy, which we shall try to illuminate.

Two arguments are usually advanced to uphold the belief that nonwhite entry depresses property prices. The first states that such entry converts neighborhoods from low-density and high-quality maintenance to high-density and low-quality maintenance, resulting in rapid physical detereoration and a depreciation of even those homes that have been well-maintained. However, this argument was completely inapplicable to the neighborhoods in Laurenti's study. In these areas the entering nonwhites kept up or improved the standards of density and maintenance that their white predecessors had exhibited. As noted previously, these neigh-

[4] One significant bias could result from the fact that Laurenti's study took place during a period of general housing shortage. Because this shortage has ended since the conclusion of his study his results need some qualification before their present applicability can be judged. This problem is discussed at length in a later section of this review.

[5] The average increase of 11.7 percent cannot be compared directly with the average decrease of 6.7 percent because the time periods involved in the individual comparisons making up both averages vary from one to six years. However, the magnitude of the difference between these two averages can be taken as a general indicator that gains in price were relatively larger than losses in price.

borhoods consisted mainly of single-family residences.

The second argument declares that nonwhite entry reduces prices because of panic selling. According to this view, as soon as a non-white buys a home in an all-white neighborhood many white owners become frightened and try to sell their homes immediately. This floods the market and causes a sharp fall in prices. Contrary to this view, Laurenti's graphs reveal no consistent pattern of either relative or absolute price declines immediately after nonwhite entry. This is true even though entry was completely unexpected in many areas. There were a few instances in which such panic occurred but even in these cases test-area prices usually regained their relative position shortly, and sometimes climbed even higher than control-area prices in the long run. But in most areas, there was no panic whatsoever; therefore this argument was also completely inapplicable.

One reason why so few white owners panicked was undoubtedly the widespread awareness that nonwhite entry would not lead to high density and lower maintenance standards. Thus the absence of the first factor usually cited as a cause of declining prices partially explains why the second factor also failed to appear.

The foregoing analysis shows clearly why property prices did not react to nonwhite entry in the way most people in the real estate profession expect them to react. Neither of the price-depreciating factors usually associated with nonwhite entry was present in the majority of test areas studied. Thus it is incorrect for anyone to argue that nonwhite entry *always* leads to either high-density use or panic selling or both. These outcomes *may* result but they are not inevitable consequences of nonwhite entry. Laurenti's study proves conclusively that no simple generalizations about the effects of nonwhite entry upon prices are valid; hence such effects can be predicted only after a careful analysis of the factors operative in each specific area of entry.

*The Market Shift and Its Effects.* One important aspect of such specific analysis is the degree to which nonwhite entry causes the market for future sales to shift from white to nonwhite buyers. Because of prevailing attitudes toward race the market for housing does not consist of a single set of available properties on the supply side and single set of buyers on the demand side. Instead, both supply and demand are divided into white and nonwhite segments. Nonwhite buyers either exclude themselves from access to the white housing supply because they do not want to live among whites, or they are involuntarily excluded by tacit collusion among realtors and sellers and by fear of violence. On the other hand, whites typically exclude themselves from access to the nonwhite housing supply because they do not wish to live in nonwhite areas. But as the nonwhite urban population grows it must be housed somehow—either by new construction on vacant land or by the shifting of extant housing from white to nonwhite use. Since most vacant land exists only in all-white areas, new housing has been built mostly within the white segment of the market, except for public housing which is usually built on land cleared for this purpose. Therefore most additions to the supply of nonwhite housing have come about through shifts of "used" housing from the white segment of the market to the nonwhite segment.

Such a shift usually starts to occur soon after nonwhites first enter an all-white area. In the areas Laurenti studied white residents rarely left *en masse* when nonwhites started moving into an all-white area; thus there was no sudden increase in the supply of homes offered for sale by whites. However, there was almost always a decrease—sometimes a sharp one—in the demand for housing by whites seeking to move into the area. This fall in white demand was invariably accompanied by the appearance of nonwhite demand for housing in the area. Once the racial "barrier" had been penetrated, nonwhites no longer felt excluded from this portion of the white housing supply and began offering to buy houses there. In fact, such transition areas were considered especially desirable by many nonwhites because they offered both decent housing and escape from nonwhite ghettos.

It is apparent from this analysis that the impact of nonwhite entry upon prices depends upon two factors: (1) the degree to which such a shift from white to nonwhite market segments takes place, and (2) differences between white and nonwhite demand for housing of a given type. The first factor simply determines the degree to which the second factor becomes operative: the more an area is shifted from one market to the

other, the greater will be the effects of whatever differences exist between these markets.

Two factors in the nonwhite segment of the housing market distinguish it from the white segment: an artificial restriction of supply and a lower-centered distribution of income among buyers. The very existence of market segments creates an artificial restriction of supply for nonwhites: they cannot satisfy their demand for housing anywhere it is available, but must confine their search to areas already penetrated by nonwhites (except for the rare individuals who "pioneer" initial entry into all-white areas). This fact creates pent-up housing demand all across the nonwhite income distribution. In those sections of the distribution where the greatest number of non-whites are clustered, the backlog of demand is greatest. Since very low incomes are most numerous, demand for low income housing is very high—in fact, it creates a great pressure to convert decent housing into small units accessible to low-income consumers. Thus the artificial restriction of supply in the nonwhite market is partially responsible for the tendency of transition to cause increases in density which eventually result in physical deterioration of property.

But there is also a high demand among nonwhites for decent low-density housing accessible to middle-income consumers. An increasing number of nonwhites are skilled workers, businessmen, and professionals capable of purchasing moderate-priced homes and just as eager as whites to maintain decent housing standards. Their total number is much smaller than the number of whites who can afford the same level of housing but, because the supply of such housing available to nonwhites is so small, the intensity of demand among nonwhites is much greater. Thus when a given area of middle-price housing shifts from the white segment of the market to the nonwhite segment, the intensity of demand for it is likely to increase. This tends to raise prices relative to similar housing still in the white market segment.

On the other hand, the intensity of demand for high-priced housing is likely to be less among nonwhites than among whites. In this case the effect of restricted supply for nonwhites is outweighed by the effect of their lower incomes. So few nonwhites can afford high-priced housing that, when an area of such housing shifts from the white to the nonwhite market segment, its value is likely to decline in comparison with similar housing still in the white segment. This is exactly what happened in the one high-priced neighborhood studied by Laurenti.

*The Effects of a General Housing Surplus.* Thus the effect of nonwhite entry upon prices in a specific area can be predicted by analyzing two basic aspects of the ensuing change in the area's "market location:" the degree to which the area shifts from the white market to the nonwhite market, and the differences between these two markets at the relevant price-level. Both of these aspects are markedly influenced by the relation between supply and demand in the housing market as a whole.

Although the supply of housing in the United States has grown rapidly since 1945, not until 1958 did it catch up with the demand generated by the backlog from World War II and the large number of families formed during the postwar period. Thus from 1945 to 1958—the period in which Laurenti conducted his study—there was a relative shortage of housing. But during the past two years, a surplus of supply has caused the housing market to become relatively "soft." This shift from shortage to surplus will affect nonwhite impact upon property values in two ways.

First, because the surplus of supply is mainly in the white segment of the market the intensity of demand for housing among whites will decline in all neighborhoods. But demand among nonwhites for housing available to them will remain relatively high because of the artificial restriction of supply explained above. Thus for white sellers in any low- or middle-income neighborhood, the relative attractiveness of selling to nonwhites will increase. If financing is available to nonwhites, they will be willing and able to offer more for desirable property than whites will if it is not in the high-price range. As a result, nonwhite entry should occur in more predominantly single-family neighborhoods not adjacent to ghettos than it has in the past.

The second effect will take place once nonwhite entry occurs. Since whites looking for homes have more alternatives than they had in the period of shortage, and since most whites do not wish to live in transition neighborhoods, fewer will offer to buy homes in such neighborhoods. Once a nonwhite citi-

zen enters a previously all-white area, the "normal turnover" demand among whites for homes in that area will fall off much faster than it did in periods of shortage. Whites living in the neighborhood who wish to move will find few white buyers who can match the prices that nonwhite buyers will be offering; therefore they are more likely to sell to nonwhites. In other words, the "soft" condition of the white housing market will cause any area where nonwhite entry has occurred to shift into the nonwhite market faster than it would have under conditions of shortage. This is precisely what happened in one of the Oakland neighborhoods which Laurenti studied, where white demand had already sagged before nonwhites entered and reversed the falling trend of values.

Essentially, a surplus in the white housing market increases the difference between the intensity of demand found in the white market and that found in the nonwhite market. Because nonwhites are denied access to most of the housing supply the intensity of their demand is not immediately affected by additions to supply made in the white sector. This changes the "terms of trade" in favor of nonwhites and should result in wider entry of nonwhites into all-white areas and faster transition of those areas to high levels of nonwhite occupancy once entry has occurred. However, these tendencies could be largely offset by a decline in the rate at which nonwhites migrate into Northern and Western urban areas. If this rate subsides, as it shows signs of doing, then the intensity of demand in the nonwhite market may decline also.[6] This would tend to make the white and nonwhite markets more alike, since a fall in demand in the latter would have the same effect as the increase in supply in the former. In any case, Laurenti's study has proved that the effect of nonwhite entry upon prices can be determined only by specific analyses of supply and demand, rather than by shibboleths about the inevitable relations between race and property prices.

*The Other Cities Studied.* Analysis of Laurenti's findings concerning San Francisco, Oakland, and Philadelphia occupies 92 percent of *Property Values and Race*. The other 8 percent consists of brief resumes of studies made in Chicago, Kansas City, Detroit, and Portland by five other authors. These studies were not part of the project established by the Commission on Race and Housing, but are germane to the general topic even though completely unrelated to each other in method, scope, and times covered. Their conclusions generally support Laurenti's own analysis with one interesting exception. In Portland, Oregon, studies were made of five neighborhoods into which a single Negro family moved, not followed by other nonwhites. So few sales were analyzed that the results are dubious but certain outcomes are of interest. First, in none of the areas was there panic-selling by whites. Second, in three out of the four areas where there were enough data for analysis, prices did not fall absolutely but did decline relative to those in comparable all-white areas. These results tend to confirm our preceding analysis of the relevant factors in forecasting what prices will do after nonwhite entry. Evidently the appearance of one Negro family shifted the neighborhood *out* of the white market but not far enough *into* the nonwhite market to hold prices stable relative to similar all-white areas.

*Limitations of the Study's Application.* Although Laurenti's conclusions cannot, in my opinion, be strongly challenged on methodological grounds, this does not mean they will be universally accepted. In fact, a basic objection is sure to be raised against

[6] Very few accurate data are available on the rate of migration of nonwhites into Northern and Western cities. However, Real Estate Research Corporation makes annual surveys in Chicago to determine the number of blocks which have more than 25 percent nonwhite occupancy. Yearly changes in this total provide a crude measure of changes in the overall rate of growth of the nonwhite population. Such growth is caused by both natural increase and net immigration but the former should provide either constant or increasing annual population increments. Hence any decline in growth rates can be attributed to declines in net immigration. The number of blocks per week converted from less than 25 percent nonwhite occupancy to more than 25 percent nonwhite occupancy for various periods from 1950 to 1959 is as follows:

| *Period Covered* | *Average No. Blocks Changed Per Week* |
|---|---|
| April 1950 (Census)—October 1952 | 2.96 |
| October 1952-October 1953 | 2.85 |
| October 1953-April 1955 | 2.15 |
| April 1955-April 1956 | 2.35 |
| April 1956-July 1957 | 3.78 |
| July 1957-August 1958 | 2.59 |
| August 1958-July 1959 | 1.94 |

These figures indicate a significant decline in the rate of nonwhite expansion from its peak in 1956-1957.

applying these conclusions to cities other than the ones he studied. This objection states that, since every city is unique, conclusions derived from San Francisco, Oakland, and Philadelphia are not necessarily applicable elsewhere. Such a view is most likely to be encountered in the form of remarks like, "it may be true on the West Coast, but in *my* city, when nonwhites move in, property prices fall." How valid is this criticism? Its validity depends upon two factors: (1) whether nonwhite entry in any given city occurs under conditions significantly different from those studied by Laurenti, and (2) it so, whether it can be proved that the differences involved mean nonwhite entry will always cause property prices to fall.

The first factor is certainly operative in a great many cities. In Chicago, for example, nonwhite expansion nearly always occurs on the edge of a giant ghetto and usually (though not invariably) involves increases in density and decreases in income and occupational-status levels in the transition neighborhoods. None of these conditions were extant in the neighborhoods Laurenti studied. The same differences in accompanying conditions exist in New York, Detroit, Milwaukee, Newark, and many other cities with significant nonwhite minorities. In fact, these particular differences are really the only relevant grounds for arguing that the conclusions Laurenti derived in three cities are not applicable to all others. The question then becomes: does the fact that these particular conditions have usually coincided with nonwhite entry in certain cities mean that such entry must lead to declining property prices in those cities?

Surprisingly enough, the answer can be derived from Laurenti's study even though he did not base his conclusions on neighborhoods where the above conditions existed. His methodology is designed to isolate the effects of racial change upon property prices from the effects of all other causal factors. Where racial transition is accompanied by increased density or lower levels of income and occupational status the effects of these factors upon property prices cannot be analytically separated from the effect of race *per se*. This intermingling of effects may lead people to "blame" racial change for results actually caused by other factors. For example, in some cities racial transition is usually accompanied by conversion of old single-family dwellings to multi-family occupancy. This causes a rise in population density and rapid physical deterioration of the converted properties. The whole neighborhood becomes downgraded and even well-maintained homes still used by only one family decline in price. Such declines are frequently attributed to racial change; whereas they are really caused by the higher density and lower economic status of the incoming population.

To escape the analytical difficulties inherent in such multiple causation, Laurenti studied only neighborhoods where racial change was not accompanied by increases in density or declines in maintenance standards. He therefore omitted neighborhoods on the periphery of nonwhite ghettos and instead selected those into which nonwhites had "leapfrogged" over sizeable distances from the nearest previous nonwhite residences. But in many American cities such "leapfrogging" is very rare; almost all nonwhite expansion occurs on the borders of large ghettos. Therefore in such cities realtors and homeowners can argue that Laurenti's conclusions simply do not apply since racial change is almost always associated with higher density and lower maintenance standards. Under these conditions, nonwhite entry seems to lead directly to neighborhood deterioration, with its ensuing declines in property prices.

Although this argument contains an important kernel of truth, it is still essentially false. The kernel of truth is that racial change is indeed bound up with other changes in many cities, for a variety of reasons. But one of the most significant of these reasons is the belief that nonwhite entry *always* leads to falling prices—a belief which Laurenti's study decisively disproves. When this erroneous belief is accepted by white homeowners, they strongly oppose entry of nonwhites into all-white areas of decent housing because they fear falling prices. Such opposition keeps nonwhites bottled up in ghettos and makes the density in them so high that whenever a new border area opens up for nonwhite settlement it is flooded with residents far beyond its capacity to house decently. This process tends to confirm the original (but erroneous) belief that nonwhite entry is invariably accompanied by rising density and falling values. A vicious circle is created, founded on what Robert Merton has labeled

a "self-fulfilling prophecy:" "A *false* definition of a situation evoking a new behavior which makes the originally false conception come true."[7] If "leapfrogging" by middle- and upper-income nonwhites into decent all-white neighborhoods were permitted in all cities (as it has been in San Francisco and Oakland) then at least some instances of nonwhite entry without higher density or falling maintenance would occur everywhere. Such universal evidence would destroy the belief that nonwhite entry *inevitably* means deteriorating neighborhoods. But at present this belief remains unchallenged in many cities because its continued existence blocks the creation of situations which would disprove it.[8]

### *Conclusion*

The great contribution of Laurenti's study is its irrefutable proof that this belief is false. By isolating racial change from the other factors which are so closely connected with it in many cities he proves that it alone need not lead to falling prices. True, such isolation prevents his conclusions from being directly applicable to many American cities. But at the same time it lays the foundation for helping those cities break out of the vicious circle caused by erroneous beliefs about race and property prices.

In itself, Laurenti's study does not automatically destroy all connection between racial transition and factors like high density or low maintenance. If we wish to discover just why these conditions often accompany racial transition and what steps can be made to disengage them from it then the whole transition process must be studied with the same intensity and objectivity which Laurenti has brought to bear upon one part of it. No doubt in some cities such a disengagement will prove a difficult task requiring immense efforts. But insofar as the connection between nonwhite entry and declining property prices is perpetuated by the belief that such a connection is inevitable, Laurenti's proof that this belief is false definitely furthers better housing and racial equality.

Because his work is not yet widely known and because prevalent attitudes regarding race and housing are reinforced by noneconomic prejudices, Laurenti's study will probably take years to have significant impact. But for informed members of the real estate profession it is of immediate importance. From now on, predicting the effects of nonwhite entry upon residential prices must be considered a matter of analyzing the relevant markets involved in each specific area rather than applying any invariant rules about the effects of race. Furthermore, Laurenti's evidence that nonwhite entry does not depress prices shifts the burden of proof onto those who claim the opposite. For these reasons, in my opinion, the Fund for the Republic certainly received an excellent return from its investment in *Property Values and Race.*

ANTHONY DOWNS

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*Real Estate Research Corporation, Chicago.*

[7] Robert K. Merton, "The Self-fulfilling Prophecy," *Antioch Review*, Summer 1946, p. 208.

[8] Such a "self-fulfilling prophecy" recently occurred in Deerfield, Illinois. When a builder revealed his plans to sell some new homes to Negroes, local residents caused a furor, stating that they feared falling property prices. This furor was so great that two other builders who had been planning to construct all-white housing withdrew from the area, thereby causing land prices to fall. They did not depart because they feared the entry of Negroes (none have yet entered and perhaps none will) but because the reaction of the community, and especially of the city building department, created what they believed was an unfavorable climate for any builder. Thus it was the uproar about falling prices that turned demand away from the area and caused prices to fall—not the appearance (or potential appearance) of Negroes. Yet the result will undoubtedly be cited as confirmation of the original fear that Negro entry would cause prices to fall—even though not one Negro has entered the area.

# Ceylon's Ten-Year Plan and Prospects

The author served during 1957-58 as consultant for the National Planning Council of the Government of Ceylon, on assignment from the Food and Agriculture Organization of the United Nations. He bases his analysis of Ceylon's situation, as presented in this article, on a review of the following writings:

*The Ten-Year Plan.* National Planning Council. Colombo, Ceylon: The Government Press, 1959, pp. 490. Rs. 5.00.

*Papers by Visiting Economists.* By J. R. Hicks, Nicholas Kaldor, Joan Robinson, Oskar Lange, John Kenneth Galbraith, Ursula K. Hicks, and Gunnar Myrdal. Colombo, Ceylon: The Government Press, 1959, pp. 123. Rs. 4.45.

*Population Projections for Ceylon, 1956-1981.* By S. Selvaratnam. A report prepared at the Demographic Training and Research Centre, Bombay, at the request of the Planning

Secretariat. Colombo, Ceylon: The Government Press, 1959, pp. 57.

*Pioneer Peasant Colonization in Ceylon, A Study in Asian Agrarian Problems.* By B. H. Farmer. London: Oxford University Press, 1957, pp. 387. 55s.

TO devise a development plan for a poor underenterprising island country with a dense and rapidly rising population almost inevitably requires a great deal of faith, hope, and foreign aid. These elements are abundantly evident in the "comprehensive Plan for development for the Ceylon economy covering both the public and the private sectors for the years 1959-68. Equally evident is the high level of professional competence of the Ceylonese who were primarily responsible for this work. Under the leadership of Gamani Corea, secretary of the Council and director of the Planning Secretariat, a small group of young economists carefully appraised their nation's situation and prospects and formulated both a long-term strategy and ten-year programs for the several important spheres of the economy. The "balanced and co-ordinated whole" is a fairly ambitious plan which, if successfully carried out, would increase national income (1968 over 1957) by 88 percent and per capita income by 36 percent. Total consumption would rise by 62 percent, but per capita consumption would go up only 17 percent in the face of expected population growth during the 11-year period. Thus, even on an optimistic projection for Ceylon, the gap between this have-not country and the prosperous West seems likely to be widened during the "golden sixties."

## I.

Indeed, some of the distinguished foreign economists who visited Ceylon as advisers during 1957-59 are notably less sanguine about the island's prospects. J. R. Hicks insists that the primary and pressing question is not how to raise living standards. The problem is, he says: "how to bring about an expansion of employment, on the large scale that is in question, while maintaining, so far as possible, the general standard of living of the Ceylon people in the process." Joan Robinson's view is that "our problem is dominated by the growth of population which is taking place." The program she outlines "is aimed mainly at fending off the disastrous fall in welfare that threatens the country but at the same time it holds out hope of a reduction in existing poverty." Gunnar Myrdal, whose oral advice to the Planning Council is reported only as a brief note in the *Papers* publication, was considerably more emphatic concerning the gravity of the prospect facing Ceylon unless the rate of population growth can soon be reduced markedly.

Oskar Lange, on the other hand, not surprisingly avoids any mention of the population question and keeps clear of any taint of overt pessimism. The charming American, J. K. Galbraith, judiciously deals with requirements for effective organization and management of public enterprise corporations and does not discuss other matters even more important. He says: "Such doubts I would have concerning the success of public development in Ceylon would turn on the failure to accord public corporations the full conditions of success." The circumstance that this society's affluence runs mainly to babies seems to have escaped him.

Fortunately, the Ceylonese planners did not try to avoid seeing the dark shadow of the demographic trap. Aware of the inadequacies of the population projections made by the United Nations and by the Ceylonese demographer, N. K. Sarkar, the Planning Secretariat arranged for an intensive study by the Demographic Training and Research Centre at Bombay. The author of the resulting excellent monograph is another Ceylonese demographer, S. Selvaratnam, of the Government's Department of Census and Statistics, who undertook the work during a period of residence at the Centre. A summary comparison of these latest projections with the earlier ones is made in terms of implied average annual rates of growth for selected 5-year periods. The United Nations projections yield a range of rates from 2.56 percent (1955-60) to 2.29 percent (1970-75), while Selvaratnam's study shows 3.01 percent (1956-61) to 2.94 percent (1976-81). Sarkar's comparable implied rates of population growth ranged from only 1.84 percent (1956-61) to 1.56 percent (1966-71) and 1.70 percent (1971-76). (Although Sarkar published his study in 1957, he assumed the mortality trends of 1910-46, a period in which mortality was declining only slowly from high-level crude death rates of around 30 per thousand. The precipitate decline of mortality after 1946 brought the crude death rate down to only 9.8 per thousand in 1956).

Sarker's projection of total population in 1966 is 10.7 millions, Selvaratnam's 12.6 millions; and the corresponding numbers for 1976 are 12.6 millions and 16.9 millions. Clearly it makes a vast difference which projection is chosen as a basis for planning. The Secretariat used Selvaratnam's projections for the Ten-Year Plan. This proper choice foreclosed any possibility of paper-plan prospects for large increases in per capita consumption. Indeed, continuing relative failure in actual economic development could lead to a rise of mortality rates to the levels assumed by Sarkar, a doubly ironic denouement.

One of the best features of the Plan document is its firm emphasis on the virtual barrier to significant economic improvement that is posed by the rapid increase in population. In the opening chapter two sections of a dozen pages are devoted to the subject. "It is clear," says the Report, "that unless there is some prospect of a slowing down in the rate of population growth and of relative stability in at least the long run it is difficult to envisage substantial benefits from planning and development." After noting the fact that conscious decision to limit births has elsewhere played a crucial part in the reduction of family size, the Planning Council suggests that "the whole question of population policy in all its aspects be made the subject of nationwide discussion perhaps through the medium of a competent Committee of Inquiry." The Council emphasized its view that family planning is not a substitute for economic development but is properly "an integral element of a broad policy designed to raise the standard of living of the people by means of the planned development of the national economy." Such official recognition that a birth control program is an essential part of an economic development program is a step, or a half-step, forward. In this respect perhaps the United States of America is the backward country.

## II.

The population prospect largely determines the planners' approach to questions of long-term development strategy. An estimated workforce of 3.5 million persons (1957) is expected to grow to 4.8 millions by 1968 and to 7.1 millions in 1981. The 1957 workforce included, however, an unknown but undoubtedly very large number of persons who, by either Western or local criteria, were unemployed or underemployed. N. K. Sarkar estimated in 1956 that of all persons then dependent on the land for livelihood, about 2.8 millions could be removed from such dependence without reducing agricultural output. Even if this estimate were reduced by half, it would indicate a "surplus" of several hundred thousands in the *workforce* in agriculture, and this human surplus is growing rapidly. Probably the extent and growth of urban unemployment and underemployment are at least as great. (While statistics for Ceylon, when available, are rightly reputed to be more reliable than for most other Asian countries, the wide ranges of many estimates and the rubbery nature of some of the official data suggest a label for these kinds of figures: elastistics.) At any rate, the foreign observer is tempted to conclude that a major fraction (one-fourth to one-third?) of the officially estimated workforce represents a "slack" of unemployed and prodigiously underemployed people. The *Plan* authors recognize the gross inadequacy of statistics of registrants at employment exchanges (113,000 in 1957) as a measure of unemployment but they nevertheless use the low 1957 figure (only 3 percent of workforce) in their basic calculations of manpower supply. When the report was published a survey of underemployment and unemployment was in progress and the *Plan* report contains the statement that "the Plan may have to be re-appraised and if necessary revised in the light of better information regarding the prevailing magnitude of unemployment."

Into what productive activities might Ceylon's rapidly expanding workforce be absorbed? The Island's actual and known potential natural resource base is small in relation to present and prospective population. Deposits of important minerals and mineral fuels are absent or unknown. All petroleum, iron and steel, and other metals for industry must be imported. Of the country's 25,000 square miles (a little less than half the area of the state of Wisconsin), 70 percent make up the Dry Zone. Much of the Dry Zone land is of poor quality and large potentially irrigible areas could be brought into production only at exceedingly high cost. The great seasonal variations in rainfall and streamflow and the scarcity of good sites for necessary large and costly

reservoirs naturally mean that Ceylon's water resource potential is economically much less significant than it is often imagined to be. Moreover, the basic water use and management requirements for irrigation, flood control, and hydroelectric power production are frequently if not typically more conflicting than complementary. Forest resources have been poorly managed, and the mounting pressure of population puts ever heavier demands on this inadequately productive resource base. Inland fisheries, now economically unimportant, could be created at many places where they do not now exist. Ocean fisheries could be exploited much more effectively, but these marine resources (not adequately surveyed) are less abundant than in many other parts of the world.

The country's poverty of natural resources suggests that its planners have been assigned the task of making bricks almost without straw. Where can truly productive employment be arranged, and fast, for an additional million or two workers on an island with little space for promising extension of agriculture and so lacking in materials and power for industry?

The Plan's answer, in terms of distribution of the additional workforce of 1.3 millions projected for 1968, is to give "maximum practicable emphasis" to industrialization and yet to recognize that "it is inevitable that the main sources of additional employment over the next 10 years would continue to be in agricultural and the service occupations." Industry and construction are each assigned about one-sixth of the increased manpower, public administration 8 percent, other services 26 percent, tea estates 10 percent, and other agriculture 20 percent.

The idea of progressive industrialization is nevertheless the "cornerstone" of strategy for long-term development. The broad conception involves an expanding use of foreign exchange (derived from increased exports and reduced imports of agricultural products and from loans and gifts) to buy abroad the capital goods needed for industrialization. The larger items of new capital investment (1959-68) for the "planned sector" of industry would be for cement plants, fertilizer production, sugar processing factories, and facilities for cotton spinning and weaving, while considerably smaller investments are listed for various other industries of the planned sector. In addition, an item of Rs. 400 million (equal to a sixth of the gross sum for the major planned sector) is recommended for capital investment in small-scale and cottage industries. Investments totaling Rs. 825 millions for hydro and thermal electricity facilities are listed for the 10-year period. Questions of industrial organization and policies—including tariffs, training of managers and technicians, local institutions for industrial finance, and the role of foreign investment—are faced and treated in an undogmatic fashion but without highly encouraging conclusions.

Gross investment per year (government, private, and "demonetised") for all sectors of the economy would increase from Rs. 700 millions in 1959 to Rs. 2050 millions in 1968, its ratio to gross domestic expenditure rising from about 13 percent to 21 percent. The government share in 1968 would be 61 percent of the total. For the 10-year period, gross investment would total Rs. 13,600 millions. Of this amount, 26 percent is allocated for social investments (housing, health, and education facilities), 23 percent for agriculture, 21 percent for electricity, and the small remainder for public administration and other services, construction, and fisheries.

The heavy investment requirements for housing, health, education, and transport and communication facilities (40 percent of the 10-year total) are of course primarily reflections of the high rate of population growth. The large allocations to the agricultural sector reflect the need to increase production of export crops in order to get foreign exchange to buy industrial capital goods. They reflect also the pressing need to improve non-export agriculture in already-developed areas in order to feed the growing numbers of people while reducing the large volume of imports of foodstuffs. Finally, they reflect the inevitable pressures for extremely costly projects for irrigation and land development in the Dry Zone.

## III.

At several places in the Plan report great emphasis is placed on the link between industry and agriculture. The success of the industrialization program obviously depends on the achievement of planned results in agriculture. ". . . . From the point of view of the balance of payments . . . it would be fatal if agriculture were to fall short

of the targets for saving imports and expanding exports as set out in the Plan." At the same time the Plan authors recognize that, in the face of rising population, the ability of agriculture to contribute in these ways to industrialization is both limited and transitory. "It cannot be expected that agriculture would be able to solve the balance of payments problems in the long run."

Some observers, indeed, have grave doubt that feasible improvements in agriculture can "solve the balance of payments problems" even in the short run. Probably most of the doubters would not seriously question the reasonableness of the production targets for the major *export* crops—tea, rubber, and coconuts—, barring major disruptions from political disturbances or fumbling "premature" attempts to nationalize the estates. The considerable subsidies, existing and planned, for replanting and rehabilitation of plantations and smallholdings are evidently effective stimulants of production, despite the uncertain political outlook. The value of these crops depends, however, on external demand and price relationships quite beyond Ceylonese control; and one does not need to be a pessimist to see, as the planners in fact do see, that the risks are high and the outlook not entirely reassuring. Yet the emphasis on export crops reflects good judgment in the circumstances, for expansion of these crops offers perhaps the last unpromising line of economic development for the near-term of ten years.

The real doubt about agricultural expansion as a contributor to industrial development concerns its potential for "saving imports" of rice and other foodstuffs. The import-saving effect is to be promoted by a stepped-up program of irrigation and development of new lands and by a program of investment and intensified agricultural extension work in already-developed areas. This latter investment program is rather arbitrarily estimated at Rs. 782 millions for the 10 years, as compared with Rs. 1092 millions for irrigation and land development (and with Rs. 1233 for the main export crops). Government investment would account for one-third in the export crop sector, 40 percent in other settled agricultural areas, and 90 percent in the irrigation and land development program. Investment requirements and related costs for the non-export programs are, in my judgment at least, seriously underestimated. Conversely, the production results would seem to be much overestimated particularly in respect to rice, the important staple food of the country.

In recent years Ceylon's imports of foodstuffs have amounted to around one-third of the total value of merchandise imports. Approximately half the Island's rice requirements is imported and in 1957 this commodity accounted for 39 percent of the value of all agricultural imports. Clearly, it makes sense to try to increase domestic production of rice and the country has in fact been doing just that for many years. The increases, however, have not kept pace with population growth.

Lord Soulbury, in his foreword to B. H. Farmer's admirable study of *Pioneer Peasant Colonization in Ceylon*, points out that some three hundred years ago a retiring Dutch governor of Ceylon pressed his successor to encourage agriculture, "in order to do without foreign rice, which consumes most of the money of the inhabitants." A hundred years later another Dutch governor wrote almost despairingly about trying to induce the Sinhalese "to plant the paddy instead of only sowing it." Farmer, an eminent Cambridge geographer and authority on land problems of Ceylon, reviews with classical competence the evolution of policies for peasant colonization in the Dry Zone and contributes a thorough and balanced analysis of the difficult problems of irrigation, land development, land use, and selection and settlement of persons in the recent and current colonization schemes. He estimates that from 1948 (when the postwar program settled into stride) through 1953, only 14 percent of the rice needed to feed the annual addition to the population could be supplied from the annual increment of newly developed paddy lands. "The conclusion," writes Farmer, "seems inescapable: even though some temporary success may be achieved by an accelerated colonization programme and by improving yields within the colonies, it is a losing battle that is being fought. Before very long, if present conditions are maintained, a decreasing proportion of the annual increment in population will be fed from the produce of colonization . . . . If one looks a little farther ahead still, the prospect for peasant colonization becomes at once more gloomy and more unsure."

Independently the reviewer reached a concurring conclusion on the basis of detailed projections of rice consumption requirements in relation to production in the Island as a whole. On the optimistic assumptions that 20,000 additional acres of paddy would be sown each year cumulatively, and that the paddy yield from all harvested acres throughout the country would increase by a half bushel an acre each year cumulatively, the projected rice *deficit* (imports) would still *increase* markedly year by year. Thus, the rice account could not realistically be expected to promise "import savings." To the contrary, larger and larger absolute amounts of foreign exchange are likely to be needed to import rice to feed the multiplying numbers of hungry people.

How then can it be calculated in the Plan that rice imports would be cut in half by 1968? Under a dissident former Minister of Agriculture (1956-59) the Ministry put forth an "Agricultural Plan" which called for some highly imaginative early increases in paddy yields—in existing acreages to be double-cropped (250,000 more), in new acreage to be developed, and in the ratio of acres harvested to acres sown. The across-the-board average yield, for example, was to be increased from about 30 bushels to 48 bushels per harvested acre in just five years. (In 1955 the Dutch scientist, J. G. Vermaat, had reported to the Government of Ceylon in his *Soil and Paddy Problems* that after "many years" of "well planned research and an efficient extension service, an average yield of 48.5 bushels per acre could be obtained.") The Planning Council evidently felt constrained to adopt much of the pattern of illusory assumptions in the Ministry's "Agricultural Plan." But it must have found the increase of yield to 48 bushels in five years a bit too far-fetched for the full period of the 10-year Plan is allowed for reaching this yield target. If so high a level is attained in one decade, the achievement would be a practical miracle without precedent in Ceylon's modern history.

IV.

Exaggeration of potentials and prospective speed of accomplishment is of course not a monopoly of any one country. Judicious hyperbole may indeed have a most salutary result for national morale. But injudicious magnification of output expectations in a seriously contrived economic plan can render the entire scheme vulnerable and may deeply vitiate its integrity as a guide for development.

Ceylon's experience offers a comprehensive example of some effects of multilateral competition and pretense in the cold war situation. Foreign countries in all quarters of the globe are sending and promising development aid of every variety; and the actual deliveries are relatively handsome, though far short of powering the dreamed-of take-off into sustained development. Most of the foreigners try officially to ignore or deny the heavy population overload as a factor that virtually guarantees the failure of take-off planning. (The sensible Swedes are a most honorable exception, having supplied a medical group of family planning experts after a longstanding offer of such aid was finally accepted.) Ceylonese politicians within and without the government, representing a wide spectrum of political ideologies and economic and communal interests, vie for popular favor with vast promises of subsidies and welfare boons. (As Joan Robinson says: "Ceylon has tasted the fruit before she has planted the tree. Her trade unions are anxious to share in profits but the energetic, enterprising and thrifty capitalists for them to share with have not yet appeared, while the welfare-oriented policy of the authorities has failed to evolve an adequate substitute for private enterprise.") In the process, local politicians eagerly encourage the competition among foreign countries for the privilege of promising and giving aid; and if a ten-year "balanced plan" fails to work, additional flows of foreign aid—at least sufficient to postpone catastrophe—are expected. The professional economists and planners, the "rational men" in the middle of the hurly-burly and subject to its complex crosscurrents, find themselves commanding singularly little influence or even much serious attention. Recent reports indicate that, in the context of continuing political crisis complicated by the murder of a prime minister, the Ten-Year Plan has come in for little discussion in the country.

Ceylon needs desperately to buy time for minimal cultural changes essential for broad and healthy economic growth. Instead, she and assorted foreign friends are allowing her grace period for attacking the demographic problem to slip away. Official specialized international agencies, held in check by the

dogmas and power of the political left and clerical right, are evasive and largely impotent in respect to the population issue. The nonsensical economic apocalypticism of a Colin Clark further intensifies the smogginess of the scene.

Soon the United States, that bewildered residual legatee of many of the world's unsolvable problems. will have to clarify its own policies in respect to official aid for birth control efforts in some of the demographic danger spots of the globe. We are deeply and rightly committed to huge programs of military, economic, educational, and other aid for many countries. The success of much of this effort is increasingly jeopardized by continuing unwillingness to face up to the population issue in relation to economic development. We will continue indefinitely to supply billions of dollars of aid each year. We should, when the recipients ask for complementary aid toward effective family planning, be prepared to extend it also. Any other course would be one of moral and political irresponsibility, involving almost certainly not only the sacrifice of the humane interests of those we seek to help but also a confused denial of our own vital interests.

Whatever may be the condition elsewhere, the situation of Ceylon is clear. In the words of B. H. Farmer: "There are certainly no grounds for the optimistic belief that future population increase can safely be taken care of by the emptiness of the Dry Zone . . . . This is not the place to review what, apart from colonization, might be done to solve the population problem; but it may well be that the only answer is a deliberate and carefully applied policy of reducing the birth-rate." There is an alternative answer: deepening human degradation and looming catastrophe.

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# Some Factors Affecting Urban Development: A Case Study

THIS paper is based on studies of the post-war growth of metropolitan Montreal carried out in the early 'fifties. It extracts from them and examines the material relating to the development of a single fringe area of the city, known as Snowdon, which was built up largely in the previous ten years. Specifically, it sets out two theses: that the social characteristics of Snowdon as it is today were determined by its physical characteristics, rather than vice versa; and that its physical characteristics were determined by the unplanned interaction of three factors: (1) the terms of the (Canadian) National Housing Act of 1944 and more particularly of the 1948 amendment which introduced the "Rental Insurance Plan"; (2) ownership and sale of large tracts of land by the city in certain other areas; and (3) municipal regulation of the development of land by means of zoning bylaws.

These theses are supported by a consideration of what Snowdon could have been expected to develop into and by setting out purely circumstantial evidence as to why it in fact became something quite different. The limitations of such an approach are obvious; but it is hoped, in spite of these limitations, to make a sound *prima facie* case and to proceed therefrom to one or two general conclusions.

The studies on which this paper is based dealt not only with Snowdon but to some extent with all the newer residential areas of the city. In particular, two other areas were examined; both, like Snowdon, lay on the outskirts of the urban area at the end of the war and experienced large-scale residential building and population growth during the subsequent decade. The three areas together accounted for 29% of the total population growth of metropolitan Montreal between 1941 and 1951, and the effects of the factors referred to were related as far as possible to the development of all three—Snowdon, Rosemount and Notre-Dame-de-Grace. However, the facts which emerged from the study of the last two became significant only in relation to the data on Snowdon and will be introduced at appropriate points for purposes of comparison.

As the crow flies, Snowdon is rather closer to the centre of Montreal than is Rosemount

or Notre-Dame-de-Grace, but as it is largely cut off from the heart of the city by the three hills of Mount Royal, Westmount and Outremont the intrusion of the urban fringe took place considerably later than in the other two areas. In 1945 Snowdon was still mainly farmland and almost all the land was in private hands, whereas in both Rosemount and Notre-Dame-de-Grace land speculation culminating in the crash of the early thirties had left most of the undeveloped land still in the hands of the City of Montreal at the end of the war.

In spite of its still predominantly agricultural character Snowdon was surrounded on three sides by prosperous urban residential areas. To the west was the town of Hampstead, an expensive and exclusive suburb; to the north the town of Mount Royal, a commuter community developed around the northern entrance to a railway tunnel leading to downtown Montreal; to the east, the city of Outremont, an older, upper-middle-class area. Hampstead was ethnically British almost entirely; Mount Royal, predominantly British with a substantial French minority; Outremont, mainly French with a large proportion of Jews.

At the time of the 1941 Census Snowdon's population was 32,000. It was concentrated around the southern and eastern periphery, in several quite distinct clusters representing the older rural settlements and the metropolitan "invasions" from various directions. These clusters of population differed both in ethnic composition and in income level according to their origin; but those which represented metropolitan "invasions" rather than old rural communities were all on a high income level and, though, not otherwise uniform in character, all represented fairly typical prosperous suburbia. At that time there would have been every reason to suppose that, in the normal course of ecological events, Snowdon would have developed as a low-density, upper-middle-class suburb much like those of any large North American city; and indeed this was assumed in an ecological study, based on Hoyt's theory of urban structure, published as late as 1948.

By 1951 the population of Snowdon had grown by 120 percent over that of 1941, to 70,000. An area, making up fully half the total extent of the district, which had had in 1941 a population of less than 6,000 had grown to over 32,000. Yet in spite of this great increase in population the built-up area had been extended only by some 350 acreas, leaving much of Snowdon still undeveloped. Of these 350 acres, about 40 were occupied by single houses, representing a population of perhaps 7,000 out of the total increment of over 26,000. The remainder, about 20,000 people, were occupying duplex (two-flat) and multiple dwellings at a gross density estimated at nearly 100 persons per acre in much of the area. Snowdon had, in fact, become a district quite unlike the prosperous single-house suburb that might have been anticipated ten years earlier. Much of it comprised long, monotonous ranks of drab, boxy apartment buildings, unvaried, close-crowded; the brick regimentation unrelieved by trees, playgrounds, open courts or parks. Schools, churches and public facilities generally were few and far between.

The observable physical characteristics can be supplemented by population data drawn from the 1951 Census. In those census tracts whose populations had increased by 100% or more, it was found that the ethnic breakdown was: Jewish, 39%; British, 25%; French, 20%; other, 16%. Educational standards and income and occupation data suggested a population mainly on the white-collar, but below the executive, level. The age and marital-status data showed that one-third of the population of "new" Snowdon was between 20 and 34, but unmarried persons over 15 constituted only 17.5% of the total population (compared with an average of 24% for the metropolitan area as a whole), suggesting that Snowdon was characteristically an area of young married couples—but not with large families: the average family size was 3.1, compared with 3.2 in the newer parts of Notre-Dame-de-Grace and 3.7 in Rosemount. This is borne out by the fact that the average number o frooms per dwelling was low (4.4, compared with 4.8 in Rosemount and 5.3 in Notre-Dame-de-Grace) but that the average number of persons per room was not notably high (0.8, compared with Rosemount, 0.9; Notre-Dame-de-Grace, 0.7). Other significant housing information includes the proportion of dwellings made up by apartments and duplex flats (98%); the proportion of tenant-occupancy (88%); and the high rents ($70 plus monthly; the Census gave no details of rents over $70).

By 1951 Snowdon had in fact assumed a distinctive character quite unlike that of any other part of the city. Physically and socially it was different, not only from the rest of Montreal but also from what, ten years previously, it might have been expected to be. It remains to see where a satisfactory explanation of these differences can be found.

Tracing the history of zoning in Snowdon, it was found that the original zoning by-law was passed in 1933, at the same time and with very much the same provisions as the original zoning of Notre-Dame-de-Grace. It is clear from a comparison of the two by-laws that Snowdon was expected and intended to develop much as Notre-Dame-de-Grace in fact did—as a prosperous residential area of predominantly single houses. A series of by-law amendments over the fifteen years following the passage of the original by-law introduced minor changes but made no difference to the basic character of the zoning. By 1948, in fact, not much development had taken place and what had been built was typically suburban. In 1948, however a striking change took place. During the following three years, to the end of the period studied, six by-law amendments admitted apartment buildings to very large tracts of land formerly restricted to single houses or duplexes and great numbers of such buildings were subsequently erected.

The reason for this sudden surge of apartment construction is easily found in what was known as the "Rental Insurance Plan." Embodied in a 1948 amendment to the National Housing Act, the Plan enabled the Central Mortgage and Housing Corporation (the Crown Corporation responsible for administering the Act) to guarantee a minimum return of rentals from rental housing projects. Such projects, built to minimum Central Mortgage and Housing Corporation standards and thus extremely uniform in character, so became, in effect, "gilt-edged" investments, guaranteed ultimately by the federal government; and they were built in great quantities.

Why did this happen in Snowdon but not (at least to anything like a comparable extent) in Rosemount or in Notre-Dame-de-Grace? The main reason was that, while in Rosemount and Notre-Dame-de-Grace most undeveloped land lay in the hands of the City, in Snowdon most of it was still privately owned. Building was therefore restricted only by municipal regulation—that is, by zoning. Given strong pressure by real estate interests plus lack of resistance by residents of what was a very new area with, as yet, no established homogeneous character to defend, zoning could be changed, and was. From this a further question follows: to what extent were Snowdon's social and demographic characteristics determined or affected by these circumstances?

Here, two sets of data are particularly significant: those relating to ethnic characteristics and to family size. Ethnically, new Snowdon in 1951 was an area mixed in a way unlike that of any other part of Montreal except for the old, run-down districts near the centre of the city. The largest single population group was Jewish, with 39% of the total; then came the British group, with 25%; French-speaking, 20%; and others, 16%. This breakdown may be compared with the preponderance of a single group in both the other study areas—70% French in Rosemount, 70% British in Notre-Dame-de-Grace—and the small proportion in neither of these two groups in both cases, 11% in Rosemount, 17% in Notre-Dame-de-Grace. Particularly significant is that there was no evidence to suggest that there was segregation on an important scale within the area; the various population groups in Snowdon appear to have been freely mixed.

As to family size, one-third of the population of new Snowdon consisted of young adults between 20 and 34; another 30% of children under 20. In both the other study areas the proportion of young adults was lower but the proportion of children higher. All three areas were young-family districts; but in Snowdon the families were, on the average, small ones.

These figures are very far from conclusive but they do attest to the character that was generally ascribed to Snowdon: that it was a place of impermanence and anonymity, a stopgap, a temporary shelter for young couples until they could find something better. An area in which 98% of the dwellings were flats or apartments, mainly the latter, in which 88% of the dwellings were rented, and in which the average number of rooms per dwelling was only 4.4, would be unlikely to attract a stable and permanent population unless it were a low-cost area giving accommodation to those who could afford nothing

better. Snowdon was not that, as the level of rents and of incomes and occupations testifies. Instead, it seems to have been essentially a stopping-off place for people who had no intention of staying there, an area of constantly changing population and no established character, and so with a character very distinctly its own.

To recapitulate: postwar national housing policy in Canada created strong pressures towards a particular type of residential development which was at odds with municipal land use controls in the City of Montreal. In some parts of the city circumstances were such that these controls were upheld, thus concentrating the pressure on one area in which these circumstances (established character and muncipal ownership of land) did not apply and where, consequently, municipal controls could be broken down, leading to the development of an area with distinctive physical and social characteristics markedly different from those which would otherwise have applied.

From this, three points can be made. First, municipal land use controls are greatly weakened in the absence of concrete support in the shape of local backing or specific characteristics of the area in question. This is well known to any town planner. The case described is only one among many.

Second, yet another factor—the unintended effects of social decisions embodied in legislative enactments or governmental policy—must be added to the long list of considerations modifying the processes of urban morphology as described by the "classical" theories of human ecology. So long has this list become that one may reasonably suggest that it is time for a comprehensive reappraisal of these theories. The "classical" ecologists set out to deal with the human community as a phenomenon worthy of scientific study in its own right. This it was and still is, but unfortunately those who studied it used a theoretical framework which proved quite inadequate to the purpose. This has resulted in the decline, almost the disappearance, of he discipline of human ecology as these inadequacies became apparent. Since the city and the metropolis are as worthy of study as social phenomena as they ever were, it may be suggested that it is time that a completely new approach to the subject was made.

Third, this study focusses attention on a problem that has so far scarcely been considered but which is of the greatest importance: the unplanned consequences which may emerge from the policies and activities of government (at any level) regarding the physical development and the use of land. In the particular case that has been described the evidence suggests that a governmental policy which was directed towards too narrowly defined an objective and the implications of which were inadequately thought out, led at the local level to quite unforeseen and in fact undesirable consequences. In view of the fact that governments at all levels are becoming increasingly involved, in one way or another, with physical development and land use, this is significant. It reemphasizes a fact which zoning studies, highway programs and other public enterprises are making increasingly clear—that a public policy or program directed towards a single, specific end, and not taking into account those things which may be affected by it or flow from it, may do as much harm as good, and that, where such policies or programs relate to any kind of change in the physical environment, they must, if their full potential for public welfare is to be realized, be related to a prehensive plan covering *all* aspects of physical development and its social and economic implications.

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# Further Comment on Economic Base Theory*

IN the February 1959 issue of this *journal* Melvin L. Greenhut has presented a wide-ranging criticism of economic base theory.[1] Much of this criticism appears to be misdirected and, given the important role played by base theory in much analytical and empirical work, calls for a rebuttal.

While Mr. Greenhut presses his attack on a number of fronts, he appears to have only one major target, namely, economic base theory as a policy guide to communities intent

* The author is an economist with the Bank of America. The views expressed here are not necessarily those of the Bank.

[1] "Comments on Economic Base Theory," pp. 71-75.

upon fostering additional economic growth. His argument rests mainly on two points. One is that the theory is based essentially on mercantilist ideas of the manner in which a community can enhance its welfare (p. 71). Use of the theory in pursuing community development, therefore, may lead to a violation of the principle of comparative advantage (pp. 72, 75).

The other point seems to be that improvements in service (i.e., nonbasic) activities by e.g., making the community a more attractive place in which to shop, may contribute as significantly to the growth of the community as expansion in the base activities (p. 74). Hence the emphasis which the theory places on the pivotal role of base industries in stimulating community growth may cause some important growth-inducing possibilities in the service industries to be overlooked.

In developing his argument on these points Mr. Greenhut makes a number of statements which indicate a lack of understanding of the substance of base theory. In this comment, therefore, we will consider whether base theory has the policy limitations Mr. Greenhut attributes to it, and we will attempt to indicate where he has gone wrong in his understanding of the substance of the theory.

### *Policy Implications of Base Theory*

A reading of the literature will provide some support to the idea that base theory contains a mercantilist bias. Andrews, for example, at one point seems to feel that one of the implications of base theory is that a community will always benefit from a "favorable" balance of trade.[2]

But this interpretation is not required by the logic of the theory. This can be seen by considering the propositions on which the theory rests. It is a truism that the level of output of any economy is limited by the quantity and productivity of the resources available to it. Base theory deals with the mechanism by which these limitations may be partially overcome. The mechanism, of course, is "foreign" trade. The area may "import" capital goods and materials to supplement "domestic" supplies of these and thereby permit resource combinations which yield a higher level of income than would be possible in the absence of these imports. Furthermore, where labor is mobile between areas, the expansion of the economy over the level permitted by "domestic" resources alone will ordinarily attract labor from "abroad." Hence "foreign" trade increases the availability of all productive resources to the local economy.

But imports of goods must be financed. This can be achieved in part by capital inflows but the greater part will usually be financed by exports. Ordinarily, therefore, an expansion of imports requires an expansion of exports. It is for this reason that base theory places such emphasis on exports: aside from improvements in resource productivity, the ability of an economy to grow beyond some (relatively low) level is set by its ability to export.

It should be apparent from this formulation that nothing in base theory *implies* mercantilism as a policy for communities intent upon additional growth. The theory states that growth ordinarily will require an expansion in exports. It does not state that this expansion must violate the law of comparative advantage. Whether this occurs or not depends upon whether the community proceeds wisely or foolishly in its attempts to stimulate further growth. Mr. Greenhut may be right in warning against attempts which violate the law of comparative advantage.[3] He is wrong in thinking that such attempts are implicit in base theory.[4]

Mr. Greenhut's second major objection to base theory as a policy guide is that it overlooks, or at least underemphasizes, autonomous growth inducing changes in the so-called service (i.e. nonbasic) activities. There is no question that some of the empirical work done within the framework of base theory lends support to this charge. The mechanical application of historical base to

[2] Richard B. Andrews, "Mechanics of the Urban Economic Base," *Land Economics*, May 1953, p. 162.

[3] For purposes of this discussion we accept Mr. Greenhut's (implicit) assumption that mercantilism is always bad policy. There are circumstances, of course, when this assumption would not be appropriate. A community may be better off by employing resources in a way which violates the law of comparative advantage if there are no alternative employments for these resources in the area and they are immobile.

[4] At one point (p. 72) Mr. Greenhut writes that base theory "makes sense provided that the principle of comparative advantage is being followed." It is hard to make sense of this statement, however, in view of his earlier statement that the thesis of his paper is that base theory "fails" in either of two forms in which he presents it. One of the reasons for failure given by him is the mercantilist bias allegedly inherent in the theory.

service employment ratios is all too common.[5] Again however, it is necessary to distinguish between the theory and the uses to which it has sometimes been put. It is necessary to assume that the base-to-service activity ratio has some stability else the theory loses relevance. Stability, however, does not mean rigidity. There is nothing in base theory which rules out growth-inducing changes in the base-to-service activity ratio so long as the growth effects of these changes are small relative to growth induced by expansion in base activities. In fact, so long as this condition is met, base theory provides a convenient framework for analysis of growth in small areas since, aside from improvements in productivity, all growth must show up either as an expansion in base activities or as a change in the base-to-service activity ratio. While primary emphasis must be given to expansion of the base, no serious analyst would take the base-to-service ratio for granted. The ratio can change significantly over time for a number of reasons. An increase in per-capita incomes, or in other variables affecting consumption patterns, may produce a change in the relative demand for service activities by residents of the areas.

There also may occur a substitution of "domestically" produced goods and/or services for imported ones. This can take two forms. One is an increase in "domestic" production for direct sale to basic industries in the areas.[6] The so-called "agglomeration effects" of the establishment of a major core industry on the industrial structure and growth of a region is an example of this. The other substitution process which can alter the base-to-service ratio is relative growth in activities in the area not directly tied to the base activities. For example, shopping centers and certain kinds of specialty shops cannot be economically operated in a community with income and population below some minimum level. Until these levels are reached, inhabitants of the community must go elsewhere for the services of these kinds of establishments or do without them. After the critical income and population levels have been reached, "domestic" production of these services can be established. The result is growth independent of expansion in the base, and a consequent decline in the base-to-service ratio.

For reasons such as these the analyst will always want to examine the base-to-service ratio even though his use of base theory commits him to the view that the major impetus to growth, aside from productivity changes, must come from expansion in base activities.[7]

Our rebuttal to Mr. Greenhut's objections to base theory as a policy guide can be summarized at this point: (1) contrary to Greenhut's view, the theory does not imply a mercantilist policy for the community seeking to stimulate additional growth although the theory has sometimes been (erroneously) cited as grounds for adopting such policies. (2) Although the rationale of the theory is that the major impetus to community growth, aside from productivity increases, is in expansion of base activities, the theory does not rule out secondary growth-inducing changes in the base-to-service ratio. We conclude that Mr. Greenhut's strictures can serve as a warning against naive interpretation and mechanical application of base theory but that, as criticisms of the underlying structure of the theory, they are way off target.

The same can be said about certain of Mr. Greenhut's statements in those portions of his article in which he sets forth his versions of the substance of base theory. The theory, he says, "takes two forms in computation." (p. 71). One "stresses the home location of the purchasers" (p. 71) i.e., basic activity is defined as export activity. The other defines basic activities as those for which the ratio of area employment to area population exceeds

[5] Mr. Greenhut (p. 72n.) cites an example of this in the work of Homer Hoyt. Another example, among several that could be chosen, is in *Planning Factors in an Industrial Program for Greater Bakersfield*, South Pasadena, California: Stanford Research Institute, 1957.

[6] It can be argued that such activities ought to be counted as part of the base. Charles L. Leven, for example, has taken this position. ("An Appropriate Unit for Measuring the Urban Economic Base," *Land Economics*, November 1954). In this case growth in industries directly supplying export industries is counted as expansion of the base. This procedure raises a problem, however, of how far back in the inter-industry chain one should go in measuring the base. There is no logical stopping point behind the industries producing directly for export. For this reason it seems more convenient from the taxonomic standpoint to count only direct exporters as part of the base.

[7] In a series of twelve articles which appeared in successive issues of *Land Economics* between May 1953 and February 1956, Richard B. Andrews dealt at length with various conceptual and empirical problems which arise in the use of base theory. Three of these articles (May-November 1955) were devoted to a discussion of "Causes and Effects of Changes in the Base Ratios and Ratio Elements." These articles make it clear that no serious student of base theory has ever assumed, *as a matter of theory*, that the base-to-service ratios are rigidly fixed.

the ratio of national employment to national population.

Greenhut's statement that these are the two forms which base theory takes "in computation" suggests that the difference involved is simply one of alternative ways of measuring a base of given size. His subsequent discussion, however, indicates that the differences are much deeper than this for he argues that the two "forms" of the theory yield different measurements of the base. He uses an example of a two-stage industry, with the first stage located in "our" area and the second outside "our" area. Consumption of the product of the second stage is proportional to population in both areas and the proportions of the population of each area employed in each stage are identical. The form of the theory which stresses the location of the buyer would count the workers in stage one as basic employees in "our" area because all of their output is exported. This is incorrect, however, according to Greenhut: "Only those (workers) who are in excess of the number required to produce that share of the total output which is ultimately consumed by local residents are basic employees; all others are service" (p. 73). In terms of the example, therefore, none of the stage-one workers is basic.[8]

It is apparent that Greenhut thinks the second form of base theory (he calls it "approximation analysis" for some reason which is nowhere made clear) is "correct," given certain assumptions, while the form which "stresses the location of the buyer" is not. His discussion of his example indicates he thinks only the *net* exports of an industry reflect basic activity. If exports are just balanced by imports, the export activity is not basic.

This argument indicates fundamental misunderstanding of base theory. The whole point of the theory is that through exports an area can finance imports which supplement its own resource base and permit a level of output greater than would be possible with "domestic" resources alone. In terms of Greenhut's example it is only necessary to ask what would happen to incomes in "our" area if, because of relatively rising costs, exports of stage-one production were to decline. Other things equal, "our" ability to import would be permanently reduced. Unless there was a reduction in the average propensity to import, and it cannot be *assumed* that this would occur, the old level of income could not be maintained. Workers would either find employment in less productive occupations or they would go unemployed. In the latter case, some outmigration of labor, and eventually other resources, could be expected. All of this stems from an initial decline in exports. Whether the decline is in *net* exports or not is irrelevant.

An expansion of first-stage exports would have precisely the opposite effect. To make the point stand out, assume that initially "our" area produced no stage-one output but that its per-capita consumption of stage-two output was identical with that in the nation as a whole. Assume that, because of technological changes favoring "our" area, "our" export of stage-one output grows until it exactly matches "our" import of stage-two output. This is the situation which Greenhut imagines in his example. In his terms no growth in the base has occurred. Yet the expansion of exports has permitted an increase in income and output which could not othewise have occurred.[9] This is precisely the role which base theory assigns to increases in exports.

The fact is that the distinction which Greenhut draws between the two "forms" of base theory is spurious. What he has done is to represent different ways of measuring the base as substantive theoretical differences. This is incorrect. Base theory says that the economic base consists of all export activities where "export" is interpreted broadly to include all sources of money flows from "abroad." These activities, perhaps, can be identified most directly by checking the place of residence of the sources of all

[8] Actually, Greenhut's example does not provide sufficient information to reach this conclusion. Workers in "our" area produce just enough to satisfy the consumption requirements of our area only if the value added per worker in stage one is identical with that in stage two. Output per man, that is, must be the same in both areas. Greenhut's example says nothing about this.

[9] Suppose the technological improvement has no effect on "our" exports and occurs in a sector in which "we" are entirely self-sufficient. There will be no permanent increase in incomes. The initial increase in production for the domestic market will stimulate imports but, with no increase in exports, the higher level of imports cannot be maintained and the old level will be restored. Since by assumption there has been no change in the average propensity to import, the old level of income must also be restored. The net result of the technological improvement in this case, therefore, is an increase in unemployment.

flows, as in Greenhut's first "form" of the theory. But in much empirical work limitations on research resources do not permit this detailed check. As a consequence analysts have resorted to the use of location quotients as a means of identifying the base. This is Greenhut's second "form" of the theory. But the purpose in using location quotients is precisely that of a listing of the geographical source of money flows—to identify export activities. The assumptions underlying use of location quotients are: (1) the product in question is precisely the same in "our" area and in the benchmark area; (2) per-capita consumption of the product is identical in "our" area and in the benchmark area; (3) none of "our" output of the product is exported until all domestic requirements have been met. When location quotients are based on employment, as they usually are, a fourth assumption is necessary; (4) output per man is identical in "our" area and in the benchmark area.

Obviously, location quotients based on employment will not provide a measure of that part of the base for which current employment is not a variable, e.g., transfer payments. But if the four conditions are met, the measurement of all parts of the base for which employment is a variable is conceptually identical with the measurement obtained by a detailed listing of money flows from "abroad."

As a practical matter the two procedures lead to different measurements of the base because the four conditions underlying use of location quotients are not fully satisfied. In particular, the "industries" for which employment data are collected are usually sufficiently heterogeneous to seriously violate the first condition.[10] Even when data are collected on a four-digit SIC basis for both areas, and this much detail is usually not available, considerable product heterogeneity is to be expected. The two areas may be trading with one another, therefore, even though both have identical proportions of their population employed in four-digit industry X and productivity and per-capita consumption of given products in the industry mix are equal in both areas. All that is required is that the proportions of given products in the industry mix of the two areas be different.

Because the necessary conditions are not usually met at all well, location quotients seldom provide an accurate measurement of the base. The *objective* of measurement, however, is the same as with that procedure which attempts directly to identify the geographical sources of money flows. In both cases the base consists of activities which generate money flows into "our" area.

This note is not intended as an *apologia* for base theory. The theory has important limitations, both conceptually and empirically. At the conceptual level we have already seen that it does not take account of the growth-generating effects of productivity increases. The further point can be made that, generally speaking, the theory loses relevance as the geographical limits of the area in question are expanded. At existing levels of income, imports are obviously much less important supplements to the resource base of the United States than they are to, say, Santa Clara County, California.

The empirical problems involved in working with the theory have already been touched on, and in any case are already well known. Despite these difficulties, the theory has a significant contribution to make to the study of economic growth in small areas. It is important for this reason that attacks such as that of Greenhut not be allowed to go unanswered.

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[10] I am indebted to Richard Peterson for pointing out to me the implications for location quotient analysis of product heterogeneity in a given industry.

# The Volume of Nonfarm Residential Construction: An Analytical Framework†

THE net relationships between nonfarm residential construction and the factors that are presumably important causes of its variation cannot be measured directly and simply through the use of available statistical techniques because of the lack of data.[1] Such relationships must be estimated through the use of what may seem to be rather circuitous techniques; and it would appear desirable to develop a scheme within which the affect of these various factors may be considered in an orderly manner. In addition, an analytical framework is required for the systematic exposition of the process by which nonfarm residential construction is influenced by its determinants. It is the purpose of this paper to present such a scheme.

### *Single-family Versus Multiple-family Construction*

The quantity of nonfarm single-family housing constructed is determined in markets that differ in an essential way from those in which the quantity of new multiple-family housing is determined. New nonfarm single-family housing is primarily a consumers' durable good; very little is built for leasing.[2] On the other hand new multiple-family housing is essentially a producers' durable good, although some multiple-family housing is built for owner occupancy as well as leasing. In this paper, the small amount of overlap will be ignored; and it will be assumed that all multiple-family housing is constructed for rental purposes and that all single-family housing is constructed for owner occupancy.

The discussion that follows will be devoted to the markets in which new single-family housing is determined. This procedure seems justifiable for two reasons. In the first place, new single-family housing is much the more important of nonfarm residential construction.[3] Secondly, the direction or change in the quantity of multiple-family housing constructed tends to conform to the direction of change in the volume of new nonfarm single-family housing. From 1920 to 1955 the number of nonfarm multiple-family dwelling units started conformed to the number of nonfarm single-family dwelling units started in 21 of the 25 years;[4] and, at a probability level of .05, the index of conformity,. 861, deviates significantly from .5, the expected value if no conformity exists.[5] The explanation of this conformity is that the same factors which influence the demand for the owner-occupancy of nonfarm single-family housing also influence the expected profitability of operating multiple-family dwelling units and, therefore, the volume of new multiple-family housing.

### *The Volume of Nonfarm Single-family Housing Construction*

The single-family housing markets that are described here relate to markets for the

† The scheme presented herein is a variation of an approach developed by Chester Rapkin, Louis Winnick, and David M. Blank in *Housing Market Analysis* (New York: Institute for Urban Land Use and Housing Studies, Columbia University, 1952), (mimeographed).

The author wishes to thank Professors L. A. Thompson, J. R. Schlesinger, H. Nicholson, and L. B. Yeager, all of the University of Virginia, for their helpful suggestions.

[1] An estimation of the coefficients of net regression of nonfarm residential construction on nonfarm population, per capita disposable income, and corporate bond yields was made using observations from the period 1929-1941. This period was chosen because, of the years 1929-1957 (years for which disposable income data are available), it was the longest during which nonfarm residential construction was not affected by direct government controls. However, the multiple correlation coefficient, R = .65, proved not to be significant, in the technical sense, at a probability level of .05—by a "wide" margin. Moreover, the estimated net regression coefficient of nonfarm residential construction on bond yields was positive rather than negative; but a negative coefficient is what is to be expected. Of course, if enough data of the right types were available, it would be possible to explain the year-to-year variation in nonfarm residential construction through the use of multiple correlation analysis.

[2] In 1950, of the nonfarm single-family dwelling units that had been mortgaged when new and on which mortgages were still outstanding, only 5.9% were not owner-occupied. United States Bureau of the Census, *Census of Housing: 1950*, Volume IV, Part I (Washington: Government Printing Office, 1952), pp. 162, 472.

[3] According to the value of building permits issued in 1956, 92.5% of the value of all privately-owned, nonfarm dwelling units constructed were single-family housing. United States Bureau of the Census, *Statistical Abstract of the United States: 1957* (78th edition, Washington: Government Printing Office, 1957), p. 755.

[4] Business and Defense Service Administration and Bureau of Labor Statistics, *Construction Volume and Costs, 1915-1954* (Washington: Department of Commerce and Department of Labor, 1954), p. 43; and Business and Defense Service Administration and Bureau of Labor Statistics, *Construction Review*, February 1957, p. 17.

[5] If no conformity between the number of multiple-dwelling units started and the number of single-family dwelling units started, an increase in the former would be just as likely to occur when the latter declined as when the latter increased.

ownership of physical units. Technically, these markets are called markets for estates in single-family fees, which may be contrasted with markets for estates in single-family leaseholds. On the one hand, a fee gives to its owner the rights of use and occupancy in perpetuity; whereas, on the other hand, a leasehold gives to its owner the rights of use and occupancy under the conditions (1) that he pay to the owner of the fee a rental during the term of the agreement and (2) that the use and occupancy of the estate revert to the owner of the fee at the termination of the agreement.[6]

Buyers of single-family fees consider existing single-family dwellings as close substitutes for new single-family dwellings.[7] Because of this, the demand for new single-family housing is to be treated as a component of the demand for fees in all single-family housing; and the markets to be described are markets for fees in single-family housing, both new and existing. The treatment of the determination of the volume of single-family housing constructed in the above manner does not violate the essential nature, from the point of view of buyers, of new single-family housing, since existing single-family housing is also primarily a consumers' durable good.[8]

Although some sellers of new single-family dwelling units operate regionally and even nationally, the markets for single-family fees are fundamentally local in nature. Thus, the volume of new nonfarm single-family housing consists of the sum of the quantities of such housing that is constructed in each market.

*The Conceptual Scheme.* The market for single-family fees will be viewed as consisting of two classes of participants: those who possess single-family housing, and those who do not. On one side of the market, i.e., the demand side, are the non-possessors; and the schedule of the quantities taken at various prices by this group will constitute the demand schedule for single-family fees.

On the other side of the market, i.e., the supply side, are the owners of existing single-family dwellings and firms in the single-family residential construction industry. However, since it is the volume of new single-family housing that is under consideration the supply of single-family fees will be treated as the sum of two separate schedules, one consisting of the quantities offered at various prices by owners of the standing stock, the other consisting of the quantities offered at various prices by the construction industry.

The supply prices of single-family dwellings which constitute the standing stock are reservation prices: At some price, P′, the owner of a single-family dwelling becomes a seller; below this price he prefers to keep the dwelling. All existing single-family dwellings are to be included in supply. Of course, some owner-occupied units would not be offered at any price which may be reasonably assumed. And, for other purposes, a portion of all single-family dwelling units might be treated as being in the single-family leasehold market. But, with regard to the latter point, single-family housing is distinguished by its mobility between fee and leasehold markets; and few owners of single-family fees would not withdraw from the business of leasing should the "right" price present itself.[9]

It may be objected that the dichotomy between possessors and nonpossessors ignores the possibility of an owner-occupant of a single-family fee being on both sides of the market. However, this seems to offer no conceptual difficulty. Insofar as a purchase is offset by a sale, the transaction is merely an exchange and does not influence the volume of new single-family housing. On the other hand, if the transaction involves an increment of housing, the difference may be considered in constructing the demand schedule.

The quantities of new single-family housing offered at various prices are determined by the cost schedules of the individual firms in the construction industry. In general, the residential construction industry is a "low" capital industry. Typically, firms within the industry "minimize" investment through such devices as renting the more costly pieces of durable equipment that is used and attributing to particular jobs the total cost of the inexpensive durable equipment that is pur-

[6] Ernest M. Fisher, *Urban Real Estate Markets: Characteristics and Financing* (New York: National Bureau of Economic Research, 1951), p. 3.

[7] Cf., *ibid.*, pp. 56ff., and Rapkin, Winnick, and Blank, *op. cit.*, pp. 38ff.

[8] In 1950, for example, approximately 78% of all occupied, detached, nondilapidated, nonfarm single-family dwelling units were owner-occupied. United States Bureau of the Census, *Census of Housing: 1950*, Volume II, Part I (Washington: Government Printing Office, 1954), p. 1-8.

[9] Rapkin, Winnick, and Blank, *op. cit.*, p. 78.

chased.[10] Even though the latter procedure does not reduce the amount of a firm's real capital, it does influence the quantity of new housing offered at given prices during short periods of time. Because of the "minimal" nature of investment in the industry, it would seem appropriate to treat the cost schedules of the firms as approximating the Marshallian long-run variety, even though the calendar time period to which the scheme refers is relatively short. Also, it will be assumed that the number of firms in the market is large, i.e., the market is competitive with respect to the supply of new single-family housing. The high rate of entry and discontinuance of firms in the industry seem to warrant this assumption.[11] As a first approximation, it will be assumed that the number of firms in the market is fixed. Later this assumption will be relaxed. But, as will be seen, the use of the alternative assumption will not alter qualitatively what is to be demonstrated.

The analytical scheme outlined above is presented diagramatically in Figure 1. The time period to which the analysis refers is one sufficiently long to enable all single-family leaseholds to expire and to enable all new single-family housing to be started and completed. In terms of calendar time, this would be about one year. Along the horizontal axis are to be measured quantities of single-family housing in terms of physical units, standardized in some way with regard to "quality." The prices at which various quantities of single-family housing are to be offered, bid for, and exchanged will be measured along the vertical axis.

The demand curve, D, is derived from the schedule of quantities of single-family housing which would be taken by nonpossessors at various prices. It is drawn to intersect the price axis, under the assumption that, at a sufficiently high price, all potential buyers would be priced out of the market. Moreover, the slope of the demand curve is assumed to be greater at higher prices than at lower prices; that is to say, it is assumed that larger increments of housing would be taken per given increment in price as price declines.[12] However, it is to be noted that the only requirement for the conclusions to be derived herein is that the demand curve

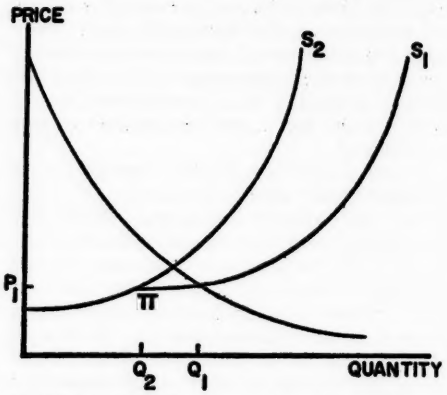


FIGURE 1—THE QUANTITY OF SINGLE-FAMILY HOUSING CONSTRUCTED DURING A SHORT PERIOD OF TIME: E.G., ONE YEAR.

be negatively sloped over the relevant interval, which seems to be corroborated by empirical evidence.[13]

The supply curve is two-pronged. The location of the left-hand prong of the supply curve, $S_2$, describes the relationship between price and the quantity of single-family housing offered by owners of the standing stock. It is assumed that $S_2$ becomes decreasingly elastic as the limit of the standing stock is approached. At some price, $\pi$, the quantities offered by owners of existing housing are augmented by quantities offered by firms in the residential construction industry. The difference between the curve of total supply, $S_1$, and the curve of the supply of existing housing, $S_2$, represents the quantity of new single-family housing which will be offered by such firms at each price. That is to say, $S_1 - S_2$ for each price is the quantity supplied of new single-family housing. It is to be noted that, in order for new construc-

[10] Miles L. Colean and Robinson Newcomb, *Stabilizing Construction: The Record and Potential* (New York: McGraw-Hill Book Company, Inc., 1952), 109ff.

[11] During the seven-year period, 1944-1950, the contract construction industry ranked first in every year except 1944, when it ranked second, with regard to the number of firms started during the year per 1,000 firms in operation at the beginning of the year; and during the same period the industry ranked no lower than third in each year with respect to the number of firms discontinued per 1,000 firms. *Ibid.*, pp. 274f.

[12] On this point see Rapkin, Winnick, and Blank, *op. cit.*, p. 40.

[13] See, for example, James S. Duesenberry and Helen Kistin, "The Role of Demand in the Economic Structure," Wassily Leontiff, *et. al.*, *Studies in the Structure of the American Economy* (New York: Oxford University Press, 1953), p. 467.

tion to take place, the demand curve must intersect the supply curve above price $\pi$. Given the market conditions depicted in Figure 1, the equilibrium price and quantity would be $P_1$ and $Q_1$ respectively, and the quantity of new single-family housing would be $Q_1 - Q_2$.

The above approach emphasizes the fact that, over short periods of time, the volume of nonfarm residential construction depends, for the most part, upon the relationship between the demand for single-family fees and the supply of existing single-family fees. The validity of this proposition stems from the durability of single-family housing. It has been said that, aside from destruction by catastrophe, the physical life of a dwelling structure may be considered indefinite from an analytical point of view.[14] At all times the stock of single-family housing is large relative to the volume constructed; for example, even in 1950 when single-family housing construction reached an unprecedented high, the number of nonfarm single-family dwelling units started was only 5% of the stock of such dwelling units.[15]

The remainder of this paper will be devoted to a description of changes, from one short period to another, in the conditions under which the volume of new single-family housing is determined. By way of introduction, reference is made to Figure 1, where it may be seen that every change in the demand curve which is not accompanied by a compensating change in the supply curve of existing housing in the *same* direction will induce a different volume of single-family housing construction.

*Changes in Nonfarm Single-family Housing Construction.* In 1950 about 76% of all nondilapidated, nonfarm single-family dwellings was owner occupied.[16] Thus, it seems reasonable to suppose that the factors that determine the supply of existing single-family dwellings are, for the most part, the same as the factors that determine the demand for single-family housing. That is to say, with the exception, on the demand side, of changes in the size of the population and, on the supply side, of the preceding period's construction, the variables which affect the quantities taken at given prices by potential owner-occupants presumably would affect also the quantities offered at given prices by current owner-occupants. But changes in the values of the joint determinants would produce effects with regard to the supply of existing single-family dwellings which are the opposite of the effects on the demand for fees in single-family housing. In diametrical terms, a shift in the demand curve which is caused by other than a change in population would be accompanied by a simultaneous shift in the opposite direction of the supply of existing single-family dwellings, providing construction were zero in the preceding period. For example, should per capita income rise, the quantities of existing single-family dwellings supplied at various prices would decline, resulting in a shift in the supply curve of existing single-family housing to the left; whereas the quantities of single-family housing demanded at various prices would increase, resulting in a shift in the demand curve to the right.

In the following discussion of changing conditions in the market for single-family fees from one short period to another, the functions will be assumed to be linear for purposes of simplification. Moreover, it will be assumed that population is constant, since changes in population from one short period to another are not especially important insofar as changes in nonfarm residential construction are concerned.[17] Finally, as a first approximation, the assumption will be made that the preceding period's construction does not affect the supply of existing single-family housing; but later its affect will be considered. It is to be pointed out that the effect of demolitions on the volume of nonfarm residential construction is so small that it may be ignored. For example, in 1953 the value of nonfarm residential housing demolished

[14] Colean and Newcomb, *op. cit.*, pp. 29f.

[15] United States Bureau of the Census, *Statistical Abstract of the United States: 1956* (Washington: Government Printing Office, 1956), pp. 773, 782.

[16] United States Bureau of the Census, *Census of Housing: 1950*, Volume I, Part I (Washington: Government Printing Office, 1954), p. 1-8.

[17] Nonfarm population influences the market for nonfarm single-family fees only through its affect on demand. Moreover, only variations in the ratio of increments in nonfarm population to total population are relevant. Since, during the period 1929 through 1941, variations in this ratio averaged 0.36% and ranged between 0.027% and 1.26%, it seems reasonable to conclude that the influence of population from one short period to another is not of considerable importance. United States Bureau of the Census, *Statistical Abstract of the United States: 1956*, pp. 5, 617.

constituted only 2.4% of the value of nonfarm housing constructed.[18]

The condition under which the construction of single-family housing would increase

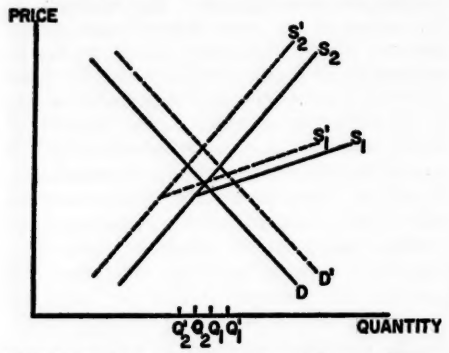


FIGURE 2—AN INCREASE IN SINGLE-FAMILY HOUSING CONSTRUCTION.

from one short period to another is described in Figure 2. *Ceteris paribus*, an appropriate change in the value of a factor that influences the demand for single family fees would result in the demand curve shifting to the right from D in the first period to D′ in the second. Simultaneously, the supply curve of existing single-family housing would shift to the left from $S_2$ in the first period to $S'_2$ in the second. As a consequence, the quantity of the new single-family housing would increase from $Q_1-Q_2$ in the first period to $Q'_1-Q_2$ in the second.

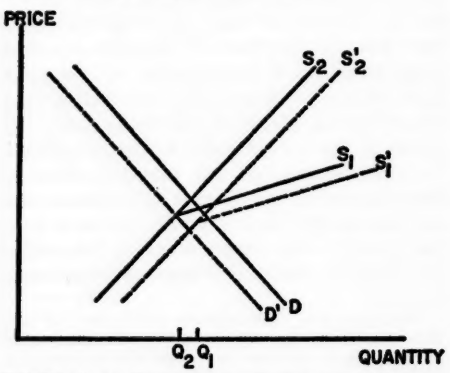


FIGURE 3—A DECREASE IN SINGLE-FAMILY HOUSING CONSTRUCTION

[18] Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects* (Princeton: The Princeton University Press, 1956), p. 385.

In Figure 3 are described the conditions under which single-family housing construction would decline from one short period to another. Here an appropriate change in the value of a determinant of demand causes the demand curve to shift to the left from D in the first period to D′ in the second. At the same time the supply curve of existing single-family housing shifts to the right from $S_2$ in the first period to $S'_2$ in the second period. Thus the volume of single-family housing construction would decline from $Q_1-Q_2$ in the first period to zero in the second.

In the two examples given above it was assumed that (1) the number of firms in the construction industry was fixed and (2) the construction of single-family housing in the first period did not affect the location of the supply curve of existing housing in the second period. At this point the implications of a variation in the number of firms in the industry and of increments to the stock of existing housing will be considered.

An increase in the excess of the quantity of single-family fees demanded over the quantity of existing single-family housing supplied at price $\pi$ (see Figure 1) would tend to increase the number of firms in the industry and therefore the difference between the supply of existing single-family housing, $S'_2$, and the total supply, $S'_1$. A decrease in the excess of the quantity of single-family fees demanded over the quantity of existing single-family housing supplied at price $\pi$ would tend to decrease the number of firms in the industry and therefore the difference between the supply of existing housing, $S'_2$, and the total supply, $S'_1$. An increment to the stock of existing housing would tend to shift the supply curve of existing single-family housing to the right. Thus, insofar as the volume of residential construction is concerned where the demand for single-family fees increased in the second period (see Figure 2), the tendency toward an increase in the number of firms in the construction industry may be offset by the effect of an increment in the stock of housing. Where demand decreased, an increment in the stock of housing would reinforce the tendency toward a decline in the number of firms in the construction industry and a decrease in the volume of residential construction; but, of course, in Figure 3, the volume of residential

construction could not have been affected by these matters, since it was zero in the second period.

*Summary*

The purpose of this paper has been to present a description of the process whereby the volume of nonfarm residential construction is determined. It has argued that (1), essentially, short-run variations in the volume of nonfarm residential construction are ascribable to changes in the relationship between the quantities of single-family fees demanded at various prices by nonpossessors and the quantities of existing single-family fees supplied at various prices by possessors; and (2), for the most part, the variables that determine the demand for single-family fees determine also the supply of existing single-family fees but the effects of changes in these variables on the supply of existing single-family fees are the opposite of their effects on demand. The facts upon which the argument was based may be summarized as follows: (1) most nonfarm residential construction consists of single-family housing; (2) both new and existing nonfarm single-family housing are primarily consumers' durable goods; (3) potential owner-occupants of single-family housing consider existing single-family housing as a close substitute for new single-family housing; and (4), at all times, existing single-family fees constitute the greater part of the supply of single-family fees.

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In New York in the building boom of the twenties (1925 to 1933 to be exact) 138 office buildings were erected with more than 30 million square feet of rentable area. From 1934 to 1946 only seven buildings were constructed, with total rentable area of 1,700,000 square feet. Actually, these buildings were for the most part initiated during the boom and opened in the depressed market. As the new square footage was being added, the over-all vacancy rate was rising so in 1934 the above-grade space showed a vacancy of more than 14½ million square feet for a vacancy percentage of 25.2 percent. Nearly 60 million square feet of space above grade was screened in some 360 buildings and the vacancy rate was 0.2 percent! This was in 1947! Even with this low vacancy rate, construction was not encouraged. A 21-story building with 260,000 square feet of space has the distinction of being the first postwar building completed in New York in 1947. It started the office building construction activity which has not slowed since that time. Buildings were torn down and new ones erected in all sections. As each completed building started to rent space, others were under construction; plans were filed for more and the office construction "snowball" continued to roll down hill, gathering instead of flakes, more and more rentable space.

Completed in 1959 were 97 buildings with more than 27 million square feet of net rentable area; another 25 were in various stages of construction with more than 14 million square feet; on the drafting boards there were eleven more with over 3 million square feet; a total of 133 buildings with more than 44½ million square feet. And, this summary does not include the spectacular announcements for new buildings made since the beginning of the year 1959.

The assessed valuation of the 97 completed buildings, exclusive of the land, amounts to more than $564 million. The 36 buildings completed in 1959 have an estimated cost of more than $407 million. In 1946 the total assessed valuation of the 1,227 office buildings exclusive of the land was $669,300,000.

In 1960, Manhattan will have 752 new apartment buildings. Along with the bulge in office construction has appeared another building boom—apartments. This is an interesting statistic, particularly so when we note that the population of Manhattan has been shrinking. Tenements are being replaced; in one case by medium-high rent and luxury apartments and in the other by middle-and low-income housing. The former has been sponsored by private builders; the latter by governmental agencies.

*The above statistics were culled from a report by the Director of Research of the Real Estate Board of New York, Gordon D. MacDonald, from data compiled in his office periodically.*

# The Role of Services in the Annexation of a Metropolitan Fringe Area†

During the last few years there has occurred a centrifugal movement of population within the metropolitan area: the population has spilled over the political boundary of the central city into the fringe and thus the densely settled urbanized area has become more extensive than the geographical limits of a single city government. Conditions such as these have given rise to the so-called fringe problem.

One possible approach to the problem of keeping political boundaries consistent with the population distribution is the annexation of areas contiguous to the central city. Although annexation would be an effective solution, it is not enthusiastically supported by many residents living outside the central city. Few of the reasons for the negative attitude toward annexation are known today; the present study is designed to investigate some aspects of the annexation issue as viewed by fringe residents.

Residents in the unincorporated fringe areas do not have the services which are provided in the central city, such as a public water or sewage system. Since fringe residents live, however, for the most part under urban conditions of density and therefore need these services, the question arises as to why people do not want to annex to the city when this step would result, ultimately, in the presence of these services.

To ascertain whether attitudes toward the quality of services are important elements in the opinion regarding annexation the following major hypothesis will be tested: The more dissatisfied residents are with services (or a particular service), the more favorably will they be inclined toward annexation. Support of this hypothesis will indicate that poor services, and the recognition of this quality, play a part in the formation of opinion regarding annexation.

† The material used in this article is taken from a study made under the auspices of the Social Science Research Project of the University of Michigan in the Fall of 1956.

The study is based on a random sample of 413 household heads living in the densely settled fringe area contiguous to the city of Flint, Michigan. The study area is only slightly larger than the urbanized area as defined in the 1950 census.

Although ultimately one is either for or against annexation, one's present ideas regarding it are usually tempered by the conditions of the present and hopes for the future. Thus there arise shades of opinion regarding annexation, ranging from greatly in favor to violently against. The annexation categories employed in this study incorporate the following criteria: I. Annexation is first choice of various possible solutions; will ultimately vote for annexation. II. Annexation is not first choice of various possible solutions; will ultimately vote for annexation. III. Annexation is not first choice of various possible solutions; will never vote for annexation. Persons in category I will be assumed to be most in favor of annexation, while persons in category III will be assumed to be least in favor of annexation. Table I shows the distribution of the sample.

TABLE I—Distribution of the Sample Among Annexation Categories

| *Category* | *Number* | *Percent* |
|---|---|---|
| I. | 72 | 17.4 |
| II. | 119 | 28.8 |
| III. | 198 | 47.9 |
| na. | 24 | 5.8 |
| Total | 413 | 100.0 |

The independent variable—satisfaction with services—does not exist by itself; rather, it is to some extent influenced by personal characteristics of the individuals involved. It has been well established in sociological literature that ideas and behavior vary with income, occupation, and education. Besides these there are a number of other variables which are relevant in this particular problem. Along with the major hypothesis as stated, then, a number of sub-hypotheses involving pre-

sumably relevant variables will be considered, as follows.

The relationship between dissatisfaction with services (or a service) and favorable opinion regarding annexation will be stronger among: (1) Persons who believe that conditions in the area have reached the point where a greater amount of governmental activity is required. Here it is assumed that those who feel that present services are adequate and that therefore no increased governmental activity is necessary will think to gain little by annexing. (2) Persons having no farm background. People with farm experience have lived, at least during part of their lives, without some services and/or are used to supplying their own services. (3) Persons having previously lived in the central city. People with experience of the city's services are likely to know them and to attach more value to services than persons who have never lived in the central city. (4) Persons who are not likely to move away in the near future. Those people whose dissatisfaction with services cannot be alleviated by moving to a different locality will probably be more in favor of annexation than those who can escape from the situation.

The services to be considered are those for which there is a great difference between the city (Flint, Michigan) and the fringe area: sewage disposal, the condition of streets, water supply, fire protection, educational facilities, lights, police protection, and garbage collection. For illustrative purposes the first service mentioned will be dealt with at length, while general conclusions will be stated for all the services and the sub-hypotheses.

The first row of Table II indicates that there is a significant negative correlation between the satisfaction with sewage disposal and favorable annexation opinion, indicating that the major hypothesis may be accepted with confidence. Regarding sub-hypothesis 1, the Table indicates that the postulated relationship (as stated in the major hypothesis) is indeed stronger for the group which believes that changes in governmental services are necessary. The difference between the measures of relationship (Tc −.341 and Tc −.213) is significant beyond the .05 level and the first sub-hypothesis is thus supported. Sub-

TABLE II—ANNEXATION OPINION AND SATISFACTION WITH SEWAGE DISPOSAL, BY HYPOTHESIS

| Hypothesis | Correlation[1] Tc | N |
|---|---|---|
| Major Hypothesis | −.417* | 376 |
| Sub-Hyp. 1: | | |
| *Gov't. Change Necessary:* | | |
| Yes | −.341* | 232 |
| No | −.213* | 144 |
| Sub-Hyp. 2: | | |
| *Farm Background:* | | |
| Yes | −.417* | 261 |
| No | −.242* | 111 |
| Sub-Hyp. 3: | | |
| *City Background:* | | |
| Yes | −.361* | 299 |
| No | −.409* | 76 |
| Sub-Hyp. 4: | | |
| *Likely to Move:* | | |
| Yes | −.376* | 142 |
| No | −.350* | 233 |

[1] The statistic used to test the various hypotheses is a recent adaptation of rank correlations, as developed by M. G. Kendall. In this procedure not only the elements within ranks, but also the ranks themselves, are ordered. A negative Tc followed by an asterisk indicates significance beyond the .05 level and thus shows support of the hypothesis.

hypothesis 2, however, is not supported. It is apparent that just the opposite relationship holds true: the postulated relationship is significantly stronger for the group with farm background than for the non-farm background group. Sub-hypothesis 3 is not supported since the difference between the relevant correlations is significant in the opposite direction as that hypothesized. Sub-hypothesis 4 is not supported, either; the difference between the two Tc's is not significant, however.

In summary, the major hypothesis is well supported with respect to the service of sewage disposal. No matter what controls are considered, the postulated relationship holds true. Several of the sub-hypotheses, however, must be reconsidered.

The order in which the services are listed in Table III was determined by the size of the correlation coefficient of the major hypothesis. The critical ratios range from more than 6.5 for sewage disposal to barely 2.0 for garbage collection and thus the major hypothesis is supported by all of the services considered. Of the 72 correlations only 14 are not significant, and half of these occur in the last service. The major conclusion which arises from

TABLE III—Relationship Between Service Satisfaction and Annexation Opinion, by Hypothesis[1]

| Hypothesis | SERVICES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sewage | Streets | Water | Fire | Educ. | Police | Lights | Garbage |
| Maj. Hyp. | −.417* | −.301* | −.284* | −.246* | −.209* | −.205* | −.200* | −.102* |
| Sub-Hpy. 1: | | | | | | | | |
| *Gov't.* yes | −.341* | −.314* | −.295* | −.203* | −.208* | −.111 | −.122 | −.019 |
| no | −.213* | −.149* | −.166* | −.188* | −.065 | −.187* | −.218* | −.055 |
| Sub-Hyp. 2: | | | | | | | | |
| *Farm* yes | −.417* | −.284* | −.256* | −.272* | −.182* | −.207* | −.223* | −.139* |
| no | −.242* | −.325* | −.294* | −.175* | −.265* | −.200* | −.164 | −.030 |
| Sub-Hyp. 3: | | | | | | | | |
| *City* yes | −.361* | −.261* | −.272* | −.227* | −.198* | −.224* | −.214* | −.111* |
| no | −.409* | −.476* | −.349* | −.328* | −.260* | −.140 | −.139 | −.059 |
| Sub-Hyp. 4: | | | | | | | | |
| *Move* yes | −.376* | −.309* | −.202* | −.251* | −.203* | −.131 | −.098 | −.139 |
| no | −.350* | −.284* | −.309* | −.245* | −.200* | −.250* | −.257* | −.077 |

[1] Asterisks indicate significance beyond the .05 level.

the study is then that dissatisfaction with services is related to positive attitude toward annexation. Whether dissatisfaction with services causes favorable annexation opinion, or whether the causal connection runs in the opposite direction, or whether both are the result of still another factor, remains to be investigated.

The measure of relationship in support of the major hypothesis, however, is still far from the theoretically possible −1.00. The postulated relationship, as it exists especially in the last four services considered, has little meaning outside of statistical significance. These low correlations indicate that there are other powerful factors besides dissatisfaction with particular services which influence annexation opinion. It is to be noted also that the correlations which appear in the examination of the sub-hypotheses are for the most part smaller than when no controls are used. This indicates that the postulated relationship exists in conjunction with other factors which this study has not succeeded in isolating. It is possible that a combination of factors discussed in the various sub-hypotheses would produce more meaningful correlations. The size of the present sample, however, does not permit the simultaneous analysis of two or more factors.

Such other factors as may exist will explain, presumably, the behavior of persons who are satisfied with services and still want annexation. The number of such persons increases in the descending order of services from sewage disposal on down, as is evidenced by the decreasing value of the correlations. If it is assumed that the relationship between dissatisfaction with services and favorable annexation opinion is constant, the data lead to the conclusion that the "importance" of services decreases from sewage disposal on down, at least in terms of their influence on the formation of annexation opinion.

Differences in income, occupation, education, and value of house owned, were investigated but these factors turned out to have no effect on the postulated relationship; discussion will therefore be limited to the four variables stated in the sub-hypotheses (Table IV).

The first sub-hypothesis is supported by the first five services but not by police protection, lights, and garbage collection. The explanation probably lies in the nature of these services. Few persons have regular encounters with the police, lights are of concern only at night, and garbage collection is of minor significance in everyday life. The other five services, which support the hypothesis, enter much more into the lives of men. Sewage facilities are needed often, streets are used frequently, water is a daily necessity, education is an ever-present problem in most families (two-thirds of fringe area families have children under 17 years of age), and fire is a danger especially in the fringe since volunteer fire crews are the rule in this area.

TABLE IV—SUPPORT OF HYPOTHESES, BY SERVICES[1]

| Services | Sub-Hypotheses | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Sewage | xx | — | — | = |
| Streets | xx | xx | — | - |
| Water | xx | xx | — | xx |
| Fire Prot. | x | — | — | - |
| Education | xx | xx | — | - |
| Police | - | - | x | x |
| Lights | - | - | x | x |
| Garbage Coll. | - | - | x | - |

[1] *Key:* xx Significant difference in predicted direction. Hypothesis supported.
x Difference not significant. Hypothesis slightly supported.
- Insignificant difference in opposite direction. Hypothesis not supported.
— Significant difference in opposite direction. Hypothesis is not supported and must be rejected in favor of one stating the opposite.
All significant differences are so beyond the .05 level.

In this connection it is well to consider sub-hypothesis 3 also. As is seen from Table IV, the data show exactly the opposite of hypothesis 1. With the exception of police protection, lights, and garbage collection, there is a significantly stronger postulated relationship for the group which has never lived in Flint than for the group which has at one time lived in Flint. The explanation is the same for both hypotheses: the groups of services are a matter of frequency of use.

It is noted that in the majority of services (and those the presumably more important ones) the measure of relationship for the group with Flint background is lower than for that without Flint background (Table III). This phenomenon appears rather strange: people move out of the city and leave behind them services which, by objective standards, are much more adequate than those of the area into which they move. Yet, these people are more satisfied with poorer services than are people who have not known the services of the city of Flint. Apparently there is something about the city, the memory of which is strong enough to overcome the lack of services, so that people would rather live with poor services than in the city. Exactly what this "something" is cannot be readily ascertained from the data. An examination of the reasons given for leaving the city of Flint sheds no light on the problem.

Sub-hypothesis 2 is supported by only three services; streets, water, and educational facilities. The difference between the two groups of services appears to be similar to that discussed in connection with the previous two sub-hypotheses, with the exception of sewage disposal, and probably fire protection. Sub-hypothesis 4 receives significant support from only three services. The common element of water supply, police protection, and lights, is unknown.

On the basis of the data it may be said then that the postulated relationship is stronger for the group which believes that changes in governmental services are necessary and which has never lived in the central city. Other characteristics are not as unequivocally related to the strength of the postulated relationship. The last three services in Table IV seem to be fundamentally different from the other services.

The subject of this survey have been the ideas of people regarding satisfaction with services but the relationship between ideas and reality must also be considered. The close correspondence of idea and reality, or the wide discrepancy between them, may well turn out to be one of the factors explaining why some people want to annex when they are satisfied with services. It is to be remembered that satisfaction is always subjective. Although a person may say that he is very satisfied with sewage disposal, reality (consisting of an inade-

quate septic tank which breaks down continuously) may resolve the inconsistency: by any objective standard he cannot possibly be satisfied.

### *Conclusion*

The hypothesis that the more dissatisfied a group is with services (or a service) the more favorably will it be inclined toward annexation, has been substantiated beyond doubt. The relationship is not as strong for some services as it is for others and it appears, furthermore, that other factors besides service dissatisfaction are important in the formation of annexation opinion. Some of these other factors have been investigated in the form of subhypotheses and it is apparent that differences in income, occupation, education, and value of house owned do not significantly influence the strength of the postulated relationship. Farm background, central city background, likelihood of leaving the neighborhood and opinion as to whether changes in governmental services are necessary, however, do influence the strength of the postulated relationship in some services. Statements can be made about these particular factors in isolation but there is as yet little which seems to tie several factors together. Further research utilizing more and exact measurements is obviously necessary; this report has indicated the direction which such future work might profitably take.

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# Public Investment in Navigation Projects: A Case Study†

### *Introduction*

EACH year a multi-million dollar public works appropriation bill is passed by Congress and the year 1959 was no exception. The 86th Congress appropriated more than six hundred million dollars for navigation and flood control projects for the fiscal year ending June 30, 1960. Even though a percentage of the appropriation was for construction of projects related to the St. Lawrence Seaway, no reduction in the annual federal appropriation for navigation projects is expected, due to the replacement of World War II T-2 tankers by larger and faster vessels. Since the taxpayer pays for navigation improvements, a case study on the influence of the replacement of the T-2 tanker by supertankers on contemporary public investment in navigation projects seems appropriate and timely.

The petroleum industry is now engaged in a construction program that will replace the T-2 type tanker with deep draft supertankers.[1] It might be noted that the trend toward the deep draft vessels is also true for other industries that are shipping bulk commodities by water. As a result of this, various port organizations are requesting that the federal government deepen harbors. In recent years increasing concern has been expressed by transportation experts regarding the methods and procedures by which federal navigation projects are evaluated and recommended for development by the Corps of Engineers, the federal

† In the summer of 1956 and 1957 the writer was employed by the United States Corps of Engineers to perform economic investigations of various southern ports. One of the investigations with which the author was connected was the Port Everglades study which is used here as a case study. *Survey-Review Report on Port Everglades Harbor, Florida,* U. S. Army, Office of the District Engineer, Jacksonville, Florida, March 1957.

[1] In recent years there has been a trend toward the replacement of World War II T-2 tankers by larger and faster tankers. The economic life of the T-2 tanker is estimated at about 20 to 25 years; by 1970 all of them in use will be obsolete. A typical ship of the supertanker type draws about 34 feet with a full cargo of perhaps 31,000 tons. This exceeds the capacity of the T-2 ship by more than 85 percent. The crew requirements, fuel consumption, and other operating costs are increased in a smaller ratio and the capital cost per ton is reduced. The resulting reduction in transportation costs to the petroleum industry is substantial. Such a ship cannot bring a full load into ports with project depths of 35 feet or less. While the vessel described above is fairly typical of the new supertankers, some are substantially larger. For important oil harbors a depth of at least 40 feet would, in theory, be necessary.

agency responsible for the improvements of rivers and harbors for navigation.[2]

The practices of the Corps of Engineers in estimating and measuring benefits of navigation projects vary with the type of projects under consideration. The basis used to estimate navigation benefits was outlined by the Federal Inter-Agency River Basin Committee in 1950. The committee reported that navigation projects, which include port improvements, may be justified if they "result in provision of needed transportation services at less total costs than may be expected to be necessary for such services in the absence of the project."[3] Benefits, according to the committee, may result in two principal ways: (1) if the project makes possible transportation service at a lower cost than alternative means, such as rail or highways; (2) if the project makes possible transportation service that would generate new traffic which would not move otherwise because of the prohibitive cost of available transportation, or the lack of available means of transport.[4]

As one may deduce from the general principles listed above, in recent years many favorable reports have been submitted by the Corps of Engineers to Congress based on the trend toward wider and deeper draft vessels. A favorable report by the Corps of Engineers does not mean that money will be immediately forthcoming for a harbor project. It can take many years from the date of the engineer report to the date the project is actually launched. The authorization amounts to a sort of a memorandum to the committee on appropriations in Congress that this particular project has passed inspection and that it is recommended as one for which money should be appropriated. However, if the supporters have enough political support in Congress, money will be included in the Annual Public Works Appropriation Bill.

### *A Case Study*

To show the influence of larger tankers on public investment in navigation projects, Port Everglades is used as an example. Port Everglades is located in Broward County, on the lower east coast of Florida, about 23 miles north of Miami and 48 miles south of the Port of Palm Beach, Florida. Port Everglades is the petroleum distribution and storage center for the entire south Florida area and one of the major centers of petroleum distribution in the Southeastern United States. Storage tanks and discharging facilities for all classes of petroleum and petroleum products are maintained at the port by many of the nation's leading petroleum companies. The existing project depth at Port Everglades in 1956 was 35 feet at mean low water and, with the trend to larger tankers, the Broward County Port Authority asked the United States Government to increase the depth to 37 feet. The change in project depth in the entrance channel and turning basin plus several other modifications would cost the federal government approximately seven million dollars.

When representatives of the Corps of Engineers investigated the possible benefits that would accrue from this project they found that the present deliveries of petroleum products at Port Everglades are made mostly in T-2 and smaller type tankers with loaded drafts up to 30 feet. Further deepening of the entrance channel and turning basin to 37 feet inside the jetty entrance, and 40 feet outside, would permit deliveries of petroleum products in larger and more economical supertankers with mean loaded drafts to 34 feet. Most of the major oil companies using Port Everglades stated that they would use supertankers for from 50 to 100 percent of their products if the harbor were deepened. Tanker sizes that were to be used ranged from the present T-2 or equivalent to a 38-foot draft supertanker. About 40 percent of the total tonnage reported was claimed for 34 foot super-

[2] For discussion of this problem see, E. F. Renshaw, "A Note on the Measurement of the Benefits from Public Investment in Navigation Projects," *American Economic Review*, September 1957, pp. 652-662; Gilbert Burck, "The Great U. S. Freight Cartel," *Fortune*, 1957, pp. 102-5, 192-202. Commission on Organization of the Executive Branch of the Government, Hoover Commission, *Task Force Report on Water Resources and Power*, Washington, D. C.; Government Printing Office, 1955; Vol. III, pp. 137-95.

[3] Federal Inter-Agency River Basin Committee, Subcommittee on Benefits and Costs, *Proposed Practices for Economic Analysis of River Basin Projects* (Washington, D. C.: Government Printing Office, 1950), pp. 74-79.

[4] The procedures used to estimate navigation benefits as outlined by the Corps of Engineers can be found in the following: Commission on Organization of the Executive Branch of the Government, Hoover Commission, *Task Force Report on Water Resources and Power* (Washington, D. C.; Government Printing Office, 1955) Vol. II, p. 874-77 and Vol. III, pp. 1328-33.

tankers, about 25 percent for T-2's or equivalent, and about 35 percent reported as uncertain. For estimating purposes the Corps of Engineers divided the uncertain tonnage between supertankers and T-2's, to give an estimate of 55 percent of the total to move by supertankers and 45 percent by T-2's.

The examination of port records showed that petroleum products, particularly gasoline and fuel oils, constituted some 70 percent of the ocean-borne traffic passing through Port Everglades. In order to provide a basis for estimating the amount of ocean-borne petroleum products that may be expected to be handled at Port Everglades in the future, the Corps of Engineers compiled the annual tonnages at each of the three competing ports for the last fifteen years of record. The percentage distribution of the total amount of ocean-borne petroleum products handled showed that Port Everglades handled some 69 percent, Miami Harbor some 27 percent, and Port of Palm Beach some 4 percent. These percentage distributions were assumed to hold good for the future by allocating to each port its share of the total consumption of petroleum products in the tributary area. This hypothesis can be questioned when one studies the rate of growth of the respective ports. Population figures were also compiled and projected into the future. Once the projected population figures were determined, an estimated average annual consumption in tons per capita was arrived at. On the assumption that average consumption tons per capita would remain reasonably constant over time, the average annual petroleum requirements for the area were determined.[5]

From the population projection, the average annual population of the eight-county tributary area for the five-year period 1971-75 was estimated to be about 2,662,000. Applying the average annual per capita consumption of 2.6 tons, the average annual demand for petroleum products in that area is given at 6,921,000 tons. To this the Corps of Engineers added an estimated one and one-half million tons of commercial aviation fuels not included in the tabulation, to give a total demand of 8,421,000 tons for the year 1971 to 1975. The Corps of Engineers estimated this as the annual tonnage of petroleum products that would move through the three ports during that period. Of that estimated tonnage, 3,352,000 tons represents tonnage that was handled through the three ports in 1955 and that will presumably continue to be so handled. The increment of 5,069,000 tons is distributed between the three ports in accordance with the present percentage of petroleum products moving through these ports. The increment for Port Everglades is 3,498,000 tons, plus the 2,227,000 tons handled in 1955, which gives an estimate of 5,725,000 tons as the anticipated average annual movement of ocean-borne petroleum products through Port Everglades in the period 1971-75.

The port records at Port Everglades for December 1955 through November 1956, show the distribution of petroleum receipts between ports of origin as follows:

| *Origin* | *Percent* |
|---|---|
| West U. S. Gulf ports | 78 |
| West Indies and South American ports | 15 |
| North Atlantic ports | 1 |
| Indeterminate | 6 |
| TOTAL | 100 |

On the basis of estimates of future use of supertankers already discussed and from information available from port records, the prospective ocean-borne receipts of petroleum products at Port Everglades were distributed by a probable origin and tanker type as shown below:

| | |
|---|---|
| *Origin and tanker type West of U. S. Gulf ports:* | |
| T-2's or equivalent | 2,576,000 |
| Supertankers | 2,004,000 |
| *West Indies and South American ports:* | |
| 34-foot-draft supertankers | 859,000 |
| *North Atlantic ports:* | |
| Supertankers | 286,000 |
| TOTAL PROSPECTIVE TONNAGE (1971-75) | 5,725,000 |

[5] It is interesting to note that in a recent unpublished report. *The Outlook for Gasoline Consumption in the United States,* Dr. Edward R. Coffrey, Associate Economist, E. I. Du Pont de Nemours and Company, found that between now and 1965, at least, United States gasoline consumption will increase at an annual rate well below the average rate of the past decade and even below the prewar rate. This fact should be taken into consideration by the Corps of Engineers in future reports.

Operating costs data for tankers expected to use the harbor following improvement are given in Table I. Hourly operating costs include allowance for interest, depreciation, port expenses, and value of vessel time to the operator for an estimated 345 days annual operation, based on existing fleets. Tankers were assumed to be loaded one way and returning empty.

TABLE I—Operating Statistics for T-2 and Supertankers

| Item | Tanker Type | | |
|---|---|---|---|
| | T-2 or equivalent | 32-foot-draft super | 34-foot-draft super |
| Deadweight tonnage | 16,700 | 22,500 | 32,000 |
| Cargo capacity (bbl.) | 141,000 | 191,000 | 283,000 |
| Cargo capacity (short tons) | 18,500 | 23,900 | 32,300 |
| Mean loaded draft (ft.) | 30.2 | 31.9 | 34.0 |
| Speed (knots) | 14.5 | 17.5 | 17.0 |
| Loading and unloading time (hr.) | 30.0 | 14.4 | 21.6 |
| Docking and undocking time (hr.) | 6.0 | 6.0 | 6.0 |
| Cost per hour: | | | |
| At sea | $145 | $225 | $274 |
| In port | $127 | $201 | $239 |

*Source:* As reported to the Corps of Engineers by the Petroleum Industry.

The average sailing distances to Port Everglades are as follows: West United States Gulf ports, 950 nautical miles; West Indies and South American ports, 1,425 miles; North Atlantic (Delaware River) ports, 915 miles. Unit savings in tanker operation costs from these areas are listed below. Present unit cost is based on T-2 delivery at full load and draft.

a. *From West United States Gulf ports:*

| *Tanker type* | *Cost per ton* |
|---|---|
| T-2 | $1.274 |
| 32-foot-draft supertanker (50 pct.) | 1.194 |
| 34-foot-draft supertanker (50 pct.) | 1.153 |
| Average Unit Savings for Supertanker | $0.100 |

b. *From West Indies and South American ports:*

| *Tanker type* | *Cost per ton* |
|---|---|
| T-2 | $1.788 |
| 34-foot-draft supertanker (100 pct.) | 1.626 |
| Unit Savings | 0.162 |

c. *From North Atlantic (Delaware River) ports:*

| *Tanker type* | *Cost per ton* |
|---|---|
| T-2 | $1.236 |
| 32-foot-draft supertanker (50 pct.) | 1.156 |
| 34-foot-draft supertanker (50 pct.) | 1.117 |
| Average Unit Savings for Supertankers | $0.100 |

Total annual savings in tanker operation costs, based on supertanker tonnages computed earlier, and unit savings for supertankers mentioned above, are summarized in Table II.

As indicated earlier, the estimated first cost of the entire project to the federal government was about seven million dollars. The Corps of Engineers allocates the total cost over the economic life of the project and the annual charges thus were estimated at approximately $275,000. As one can see in Table II, the annual benefits from tanker operations alone were estimated at $368,000; a favorable ratio of benefits to costs. Of course, there were numerous other items that benefits were accrued to; and a favorable report was submitted by the Corps of Engineers to Congress.

TABLE II—Average Annual Benefits from Tanker Operations Expected at Port Everglades, Florida

| Origin | 1,000 tons | Unit savings dollars | Total savings dollars |
|---|---|---|---|
| West U. S. Gulf Ports | 2,004 | $0.100 | $200,400 |
| West Indies and South American ports | 859 | $0.162 | $139,200 |
| North Atlantic ports | 286 | $0.100 | $28,600 |
| Total | 3,149 | .... | $368,200 |

### *Conclusion*

As pointed out in the introduction, each year Congress passes a multi-million-dollar public works appropriation bill. With the trend towards larger and deeper draft vessels we can expect large appropriations for navigation projects in future fiscal years. Since the taxpayer shoulders the burden of the navigation improvement and maintenance, he is entitled to receive the expected benefits. In the case of the petroleum

industry, direct benefits need bear no relation to social cost. The taxpayer has no assurance under conditions of oligopoly that the firm in the industry will not siphon off what benefits occur. In this connection, it might be desirable to revise our present method of measurement of the benefits of public investments in navigation projects.

An examination of navigation literature makes it quite clear that many transportation economists are not satisfied with the method and procedure by which contemporary public investment in navigation projects is justified. According to a House Committee report, all too frequently projects have been approved on a basis of a slim margin of tangible benefits over estimated costs.[6] Assuming this report is correct and considering the fact that direct benefits needs bear no relation to social cost, it would seem that more realism is needed in the evaluation of proposed navigation projects. In this connection, it would seem desirable for Congress to look for relevant alternatives to public investment in navigation projects. Two alternatives that require investigation and analysis are subsidies to other modes of transport to lower their rates to the expected water rates and user charges on the waterways.

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[6] *Jones Report*, House Committee Print, Numbers 21 and 24, 82nd Congress Second Session, December 5, 1952.

# Another View of Comparative Regional Development

MOST raw materials lose weight when processed or manufactured into finished products. Also, highly industrialized areas depend largely upon less industrialized areas for food supplies. It follows that highly industrialized regions will be likely to import a greater tonnage volume of commodities than they export, and that less industrialized regions will export a greater tonnage than they import. A comparison of freight tonnage originating with freight tonnage terminated within a region should indicate whether the region is primarily an industrialized or a raw-materials-producing region. If tonnage terminations exceed originations, the region may be classified as an "industrialized" region, while if originations exceed terminations the region is a "raw-materials-producing" region. Comparisons of the origination-termination characteristics of different regions should indicate, roughly at least, the relative degrees of industrialization in such regions. Further, comparisons of regional origination-termination characteristics over time should show whether particular regions are becoming relatively more or less industrialized and should provide a comparative measure of changing regional industrial interrelationships.

The Interstate Commerce Commission, based upon its one percent waybill sample, publishes fairly complete and apparently reasonably reliable annual statistics covering state-to-state commodity movements by railways in this country. Unfortunately, similar statistics covering other forms of carriage either are not available in published form or, at best, are admittedly rough estimates. Long-haul traffic logically might be expected to adjust itself to existing resource, population, and industrial conditions, but it is not likely that the overall inter-regional commodity flow pattern differs significantly from the rail pattern.[1] A study of published rail distribution patterns should cast some light upon regional and inter-regional industrial development.

The exclusive use of railway commodity figures for regional comparisons over time has risks, of course. Rail ton-mileage as a percent of all ton-mileage has decreased during recent years (for example, from 61.3 per cent of the total in 1940 to 49.4 percent in 1955). But, at the same time, rail ton-mileage has increased absolutely (1955 volume being about two-thirds greater than 1940 volume).[2] To the extent that new firms locating in a particular region during the time period under study

[1] Cf. Stuart Daggett, *Principles of Inland Transportation*, 4th edition (New York: Harper and Brothers, 1955), p. 152; and Edward L. Ullman, *American Commodity Flow* (Seattle: University of Washington Press, 1957), p. 2.

[2] Various *Annual Reports* of the Interstate Commerce Commission.

have chosen non-rail rather than rail transport, and to the extent that existing traffic diverted from railways may have consisted proportionately more of manufactured goods than of raw materials, or vice versa, error may enter. But pipeline and water transport is limited to a small number of commodities, as well as by the physical location of waterways and oilfields; truck transport principally is short-haul rather than long-haul; and air freight is relatively insignificant quantity-wise. It is not likely that any serious distortion of the interregional traffic flow picture results from the exclusive use of railway data even though a time period of several years may be involved. In any case, a measure with some probable error may be preferable to no measure.

The author has compared total rail freight originations with total terminations, as revealed by the Interstate Commerce Commission, in various regions for the years 1940 and 1955 (see Table I). The former year was the last complete pre-World War II year while 1955 data were the latest available at the time the comparison was made. While the author is not rash enough to suggest that the traffic flow during any given year is "typical," it should be remembered that during both 1940 and 1955 the general level of economic activity was high and rising.

The particular regional grouping made by the author was based on his evaluation of geographic, economic, and transportation similarities and relationships between states with some attention to Interstate Commerce Commission territorial groupings. Any such regional construction may be criticized on grounds of arbitrariness, of course. Basically, though, analysts draw regional boundaries in the way which best shows whatever the analysts are attempting to show. The author, therefore, while realizing that different regional groupings might give somewhat different results, feels that no further defense of his particular arrangement is necessary.

Table I indicates that the "northeastern" section of the country (Regions I, II, and V) still is more highly industrialized relatively than other sections. Three other regions (III, VII, and XI) must be classified as "industrialized," however, according to our criterion (terminations exceeding originations).

TABLE I—PERCENT OF RAILROAD FREIGHT TONNAGE TERMINATIONS TO ORIGINATIONS, BY REGIONS: 1940 AND 1955*

| *Region* | *Percent Terminations to Originations* (1940) | (1955) |
|---|---|---|
| I. (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) | 240 | 215 |
| II. (Delaware, District of Columbia, Maryand, New Jersey, New York, Virginia) | 223 | 186 |
| III. (Florida, Georgia, North Carolina, South Carolina) | 130 | 122 |
| IV. (Pennsylvania, West Virginia) | 43 | 58 |
| V. (Illinois, Indiana, Michigan, Ohio) | 146 | 121 |
| VI. (Alabama, Kentucky, Mississippi, Tennessee) | 57 | 64 |
| VII. (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin) | 75 | 103 |
| VIII. (Arkansas, Louisiana, Oklahoma, Texas) | 90 | 93 |
| IX. (Colorado, Montana, New Mexico, Utah, Wyoming) | 78 | 68 |
| X. (Idaho, Oregon, Washington) | 84 | 79 |
| XI. (Arizona, California, Nevada) | 104 | 103 |

* *Source:* Interstate Commerce Commission, *Tons of Revenue Freight Originated and Tons Terminated in Carloads by Classes of Commodities and by Geographic Areas: Class I Steam Railways:* 1940; and *Carload Waybill Statistics, 1955: State-to-State Distribution of All Commodities Traffic and Revenue.*

Several interesting shifts in regional origination-termination relationships (that is, in the relative degrees of regional industrialization, as defined) occurred between 1940 and 1955. All of the five 1940 "industrialized" regions show a smaller percent of terminations to originations in 1955 as compared to the former year, with the most significant changes occurring in Regions V, II, and I, respectively. Four of the six 1940 "raw-materials-producing" regions increased their terminations as a percent of originations, with one region (Region VII) actually moving from the "raw-materials-producing" classification into the "industrialized" category. Two of the "raw-materials-producing" regions (Regions IX and X), however, show a lower

percent of terminations to originations in 1955 than in 1940.

Changes in origination-termination relationships within a region over time may be caused by changes in the level of its manufacturing industry or of its raw materials output, or by both. In order to obtain a better picture of the causes of the origination-termination relationship changes shown in Table I, and to further illuminate shifts in the relative levels of regional and interregional manufacturing activity, a comparative study of regional "manufactured and miscellaneous" products originated by rail in 1940 and 1956 (the latest year for which such data were available) was made.[3] The result is shown in Table II.

The traditional "industrial heartland" of the country, Regions I, II, IV, and V, according to the computations presented in Table II, shows a significant decrease in the relative level of manufacturing activity as compared to the remainder of the country between 1940 and 1956. This decrease, with the exception of Region IV, is consistent with what we might have expected from our comparison of origination-termination relationships as shown in Table I. The different behavior of Region IV (declining proportion of total national manufactured tonnage originated together with a percentage increase in terminations as a percent of originations) possibly may be explained as due to a relatively greater decrease in raw materials tonnage originated than the decrease in manufactured goods originations.[4]

In like manner, the proportionate increase in manufactured tonnage originations in Regions III, IX, X, and XI between 1940 and 1956 (shown in Table II) may be reconciled with the decreasing percentage of terminations to originations in those regions (shown in Table I) by the supposition that, although manufacturing activity has increased in those regions, raw-materials-output has increased relatively faster. This hypothesis has been tested and found to be correct for one region (Region X) by a more detailed study of that region's originations and terminations between 1940 and 1956.[5]

TABLE II—PERCENT OF TOTAL UNITED STATES RAILROAD FREIGHT TONNAGE OF MANUFACTURED AND MISCELLANEOUS PRODUCTS ORIGINATED IN VARIOUS REGIONS: 1940 AND 1956*

| Region[1] | Percent Originated (1940) | (1956) |
|---|---|---|
| I. | 3.4 | 2.8 |
| II. | 13.8 | 11.8 |
| III. | 3.9 | 5.2 |
| IV. | 18.5 | 14.7 |
| V. | 29.6 | 25.7 |
| VI. | 5.5 | 7.6 |
| VII. | 8.7 | 10.4 |
| VIII. | 8.9 | 10.7 |
| IX. | 1.8 | 3.2 |
| X. | 1.6 | 2.4 |
| XI. | 4.2 | 5.6 |

* *Source:* Interstate Commerce Commission, *Tons of Revenue Freight Originated and Tons Terminated in Carloads by Classes of Commodities and by Geographic Areas: Class I Steam Railways, 1940:* and *Carload Waybill Statistics, 1956: State-to-State Distribution Manufactures and Miscellaneous and Forwarder Traffic (C.L.) Traffic and Revenue.*

[1] Numbers used here correspond to those used in Table I.

Several very general inferences may be drawn from the foregoing. The northeastern portion of the country still maintains its leading position as a manufacturing center. The locational pattern appears to have been working toward a somewhat more even distribution of industrial activity during the period studied, with the "raw-materials-producing" regions increasing their manufacturing activity at the relative expense of the "industrial" regions. Such equalization appears to be developing rather slowly overall, though, with some exceptions to the trend and at considerably different regional rates of speed. And, in general, the "raw-materials-producing" regions have a long way to go before attaining the relative manufacturing intensity of the "industrial" regions.

During recent years much activity has occurred in that branch of economics sometimes referred to as "regional economics." Various "raw-materials-producing" areas have been attempting to attract

[3] The Interstate Commerce Commission groups all commodities into five general categories, including "Manufactures and Miscellaneous," "Products of Agriculture," "Products of Mines," "Products of Forests," and "Animals and Products."

[4] Although 1955 "all-commodity" figures are shown in Table I, and 1956 "manufactures-and-miscellaneous" figures in Table II, it is the author's belief, based upon study of these statistics, that no significant distortion results from the use of these different years.

[5] See the author's "Rail Movements of Forest, Farm, and Factory Products To and From the Pacific Northwest," *University of Washington Business Review*, October 1958.

new manufacturing industry while "industrial" areas have attempted to hold that which they have. Both theoreticians and practitioners have given a great deal of attention to the numerous influences which may sway a firm seeking a home. Almost without exception, transportation costs (or, more correctly, freight rates) have been considered as one of the more important locational determinants. "Favorable" freight rates cannot in themselves promote regional industrialization, of course. But they may play an important role in such development, either as facilitating or as limiting devices. Advocates of more rapid industrialization of the "raw-materials-producing" areas, if they are to reach their goals, must work toward "favorable" freight rates. And those who favor the present locational pattern likewise cannot ignore freight rate structures. Without making a value judgment either for or against a more equalized regional industrial locational pattern, perhaps we can develop a hypothetical framework which will indicate the type of freight rate structure most compatible (or least compatible) toward such regional equalization. Then we may be able to compare our present rate structure with our hypothetical framework and see whether our present rates tend to retard or to accelerate the dispersion of industry.

We may postulate that a region may go through at least three stages of industrial growth. The first stage is characterized by an industrially immature or "colonial-type" economy wherein the region primarily is an exporter of raw materials and an importer of finished products. This was the position of the United States, as related to Western Europe, until the post-Civil War era and has been the position of most Southern and Western regions of our country as compared to the Northeast during more recent times. Next, a region may reach industrial maturity which is characterized by large imports of raw materials and exports of finished products. Finally, the region may enter a stage of industrial senility, characterized by a relative (or perhaps even an absolute) decline in its finished goods exports as its markets are penetrated by former industrially immature regions which now have approached or reached a stage of maturity. Internationally, we may see examples of these stages of growth in the historical development of Great Britain (all three stages) from the pre-Industrial Revolution period and, in the United States (the first two stages), during the past century.

An historical comparison of the tariff policies of Britain and the United States would reveal definite policies in regard to "free trade" versus "protectionism" which may be related to the above-named stages of industrial development. While British industry was building up its forces in a battle for dominance over other Western European industry, Britain was very protection-minded. Once a solid industrial base for dominance had been established, however, Britain became a free trade leader. And in more recent years, as Britain's dominance has declined, it has reverted to protectionism. In the same way the United States was not strongly protectionist during our early history as a nation. With our greater emphasis upon industrial growth we became protection-minded. Then, once our dominance had been achieved, we became more interested in free trade. These examples, and others which could be cited, indicate that modern nations always have regarded tariff policy as an important tool in industrial development, and apparently rightly so.

The economic effects of a freight rate are the same as those of a tariff. Low freight rates on outgoing raw materials, or low rates on incoming finished products, tend to perpetuate the interregional status quo by encouraging raw materials exploitation and discouraging manufacturing activity in "raw-materials-producing" regions. Higher rates on outgoing raw materials shipments and on incoming manufactured goods tend to encourage interregional decentralization of industry by making local manufacture more profitable and the export of raw materials less profitable. How does our existing freight rate pattern fit into this framework?

The influence of the "value-of-service" principle in railroad freight rate-making is well known to students of transportation. This results in many rates based on "out-of-pocket" costs rather than on full costs, in rates which taper considerably as the length of haul is increased

and, particularly in transcontinental rates, extensive blanketing practices which mean that eastbound freight rates on many western raw materials and foodstuffs reach a maximum at the eastern edge of the Rockies, in the Plains states, or at or near the Mississippi, and do not further increase with distance thereafter.[6] Such practices, by making it possible for bulky, low-value-per-ton, raw materials to move from outlying regions into the industrialized northeastern section of the country at low rates, in addition to whatever other effects they may have, obviously tend to encourage the concentration of industrial activity in that section and to make it more difficult for competing manufacturers to become established in the "raw-materials-producing" regions. The industrially dominant Northeast, which in international trade parlance stands to benefit industrially from low tariffs, actually has such tariffs while the raw-materials-producing hinterlands, which need temporary tariff protection to aid in building up their home industries, are not getting such protection. And, ironically enough, it appears that those groups which are most actively engaged in promoting industrial development in the "raw-materials-producing" regions frequently are the same groups which vociferously advocate freight rate policies diametrically opposed to such industrialization!

The author, in this paper, is taking no position on the merits of further regional industrial centralization or decentralization. The arguments on both sides are well known and, in part at least, are based upon personal value judgments. It is hoped only that this study will be of some benefit in pointing the way to our goals, whatever they may be, once goals have been established.

In summary, this paper has suggested and explained an additional quantitative measure for determining relative degrees of industrialization within and between regions. This measure has been applied to various defined regions, showing both interregional comparisons during given time periods and changing interregional relationships over time. Certain explanations of these comparisons and interrelationships, and certain conclusions based upon them, have been presented. In addition, a theoretical framework related to the empirical material contained herein, and with implications for national or regional public policy in the area of industrial location, has been drawn. The "practical" usefulness of this measure and its accompanying theory, of course, depends upon its dissemination and acceptance as well as upon the development of more comprehensive and reliable statistics and further refinement of the theory. This paper deals with a project which still is closer to the starting line than to the finishing ribbon.

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[6] Many such rates are described in Stuart Daggett and John P. Carter, *The Structure of Transcontinental Railroad Rates* (Berkeley: University of California Press, 1947). Other more specialized studies include Truman C. Bigham and Merrill J. Roberts, *Citrus Fruit Rates* (Gainesville: University of Florida Press, 1950); William S. Peters, "Montana's Carload Rail Freight Bill," *Montana Business Review*, April 1958; and Roy J. Sampson, "Changing Freight Rate and Delivered Cost Patterns for Competing Southern Pine and Douglas Fir Lumber," *The Atlanta Economic Review*, April 1956.

# A Pure Theory of Urban Renewal†

A COMMON observation of students of the urban phenomenon is that recent decades have witnessed the beginning of a great suburban migration. Supposedly, this migration embraces not only the residential use of land but the commercial as well, and there is some indication that even industrial land uses are falling into the line of march away from downtown congestion, taxes, high land values, and restricted areas to the open spaces of suburbia. The result is what is commonly called "blight," the deterioration of property in certain areas of the central city. Property owners, business enterprises, and city officials all are agreed that "something

† The author wishes to express gratitude to Professors James M. Buchanan and John E. Moes of the University of Virginia for many helpful suggestions. He also benefited from the critical comments of Professor Charles M. Tiebout of the University of California at Los Angeles and from discussion with Harry L. Johnson, Harvey J. Wheeler, and Clinton H. Whitehurst.

must be done," and the popular "solution" is that the federal government make money available for urban "rehabilitation."[1]

The purpose of this essay is twofold. First, we shall inquire into why persons think something is "wrong" with the existing situation and second, we shall attempt to construct a model which will be used to indicate certain rules of action for policy makers.

### *The Problem*

A city or town, as opposed to a metropolitan area, is a legally defined entity. It has given boundary lines and is characterized by a hierarchy of elected and appointed officials who serve to carry out certain defined duties.[2] Revenue is usually raised through a system of property taxes.

Now what are the observations that have made persons conclude that something is wrong or how is a blighted area recognized? First, some hold that a change in the ratio of immigration to emigration so as to result in the net loss of population near the center of the city is one such indication.[3] This position, I would hold, is not necessarily correct. Not only may a change in the factors under which individual decisions are made result in a net loss of population in a given area without anything being considered wrong but many areas considered as blighted are among the most densely populated areas of the city.

Second, an exodus of population may also mean an exodus of purchasing power; and business men in a given area may note a lowering of sales. Thus they may be induced to conclude that something is wrong. This position, however, will not stand critical evaluation. Loss of sales per se may or may not be an indication that something is wrong with the structure of urban property.[4]

Third, the City Fathers may note that, with a given level of property tax rates, receipts are falling and this fact may induce them to conclude that something is wrong. Again, falling tax receipts per se is not sufficient evidence that something is wrong with the structure of urban property.

Finally, and closely associated with the above point, individuals may observe that property values in some certain portion of the city are falling in relation to the values of the remainder of the metropolitan area, that the general characteristics of the selected area are distasteful, and they may term the particular area blighted, concluding that something is wrong.

This final point, dependent as it is upon the judgment of human beings, defies precise definition; yet it states essentially the method whereby individuals are led to label an area as blighted. That is to say, individuals generally recognize blight by observing that property values in some given portion of a metropolitan area are falling in respect to the remainder of the area and that "conditions" are unpalatable to the eye.[5] In this discussion we shall assume that there is consensus and that individuals mutually recognize blight. While this assumption is not necessary for our discussion, it does add simplicity.

Why, however, does the existence of blighted areas mean that something is wrong? Why are not existing structures kept in an acceptable state of repair or, alternatively, why do not individual entrepreneurs buy existing blighted areas, remove undesirable structures and replace them with new ones?

Part of the answer to the above question is alleged to lie in the nature of municipal growth and expansion. It is asserted that owners of property near the center of the city have exaggerated notions of the probable extent and timing of municipal expansion. If such is the case, they may tend to neglect possible improvements of

[1] The Committee for Economic Development recently has begun an Area Development Program which appears to be mainly concerned with municipal or metropolitan area problems. For example, see the following CED publications: *The Little Economies;* Raymond Vernon, *The Changing Economic Function of the Central City;* and Robert C. Wood, *Metropolis Against Itself.*

[2] The governmental structure of any metropolitan area is, of course, exceedingly complex and this factor, to an extent, complicates our discussion. We shall speak in terms of the city instead of the metropolitan area because the former term is more appropriate to our analysis. For one example of how this problem has been handled, see Julius Margolis, "Municipal Fiscal Structure in a Metropolitan Region," *Journal of Political Economy,* June 1957, pp. 225-36.

[3] For example, see Ernest M. Fisher, "Economic Aspects of Zoning, Blighted Areas, and Rehabilitation Laws," *American Economic Review,* March 1942, pp. 334-5.

[4] For an extreme example of this, the above, and the following points, witness the "ghost towns" of the West.

[5] This statement may be rephrased as follows: There exists in the human mind some arbitrary minimum below which conditions are viewed as inadequate for "decent living."

existing structures and to establish miscellaneous temporary uses in anticipation of the arrival of more intensive retail, wholesale, and office uses which might bring the owner of the property a handsome capital gain.[6] Insofar as this line of reasoning is true, the existence of blighted areas cannot be taken to mean that something is wrong.[7] Individuals are generally left free to attempt to maximize the return from their property and, if individual calculations indicated that, because of the nature of the growth process, returns from some given properties are maximized by allowing deterioration in anticipation of the arrival of a more intensive use, then our conclusion must be that the market mechanism is acting in its "normal" manner in the process of resource allocation. Instead of saying that something is wrong, we would conclude on the basis of this argument that the price mechanism works "slowly" in the urban property market. Given sufficient time and if external diseconomies are not present, the situation would correct itself in that existing blighted areas would be replaced by the more intensive uses. Indeed, this line of reasoning means not only that no governmental action is necessary but that any action that might be taken could be wasteful since the relatively permanent structures which might be erected could conceivably have to be removed to make room for the more intensive uses.

Some argue that the reason individuals allow their properties to become downgraded is that all persons consider the environment surrounding their property when decisions concerning it are made. This proposition is of course true but it is not an argument that can explain why individuals allow their property to *become* blighted.[8] All urban property, by definition, is new at some point in time and the general rule is that development takes place in area terms. These areas form the environment and, if at the time of construction the environment is acceptable (and it is such by definition), then there is no a priori reason to think that *individuals* will take any action which would result in lowering property values.[9]

The above argument does, however, have some validity when one considers that part of the environment is formed by municipal action. If the city does not provide the proper public services such as streets, playgrounds, parks, etc., to satisfy modern demands, then it is conceivable, if we assume demands for public services to change, that the environment could cause blight to occur. When stated in this form, the argument simply means that the proper services should be provided; it is not an excuse for state or federal action.

Another pertinent implication of the above argument, although it is not usually stated explicitly, is that once an area is blighted it creates such an atmosphere or environment that external diseconomies are present; that is, a given number of dollars invested in a structure in a blighted area will not create as much value as will the identical dollar investment elsewhere. Thus, it is argued that governmental intervention is warranted to remove the blighted area. Two points are relevant here. First, while it is no doubt true that external diseconomies are associated with blight, the externalities argument does not answer the question as to why blight occurs in the presence of modern zoning restrictions. If the zoning ordinances are effective, then those uses and structures which might create external diseconomies should be prohibited in any given area, and it is only in the absence of proper zoning restrictions that the externalities argument does provide a reason why blight can occur.[10] Second, even if we ignore the question of why blight occurs and simply assume its presence, it does not logically follow that governmental action is justified. The line of reasoning begs the question as to why it would not be

[6] Fisher, *op. cit.*, p. 334.

[7] The discussion in this paragraph overlooks the possibility that external diseconomies associated with these temporary uses might cause the transition to never take place. The case of external diseconomies is treated at a later point.

[8] Unless, of course, it is considered as identical to or including the previous argument. If the previous argument is ignored, or if the two arguments are considered as separate, then the discussion in this paragraph follows.

[9] Once again, it is assumed that external diseconomies are not present. Externalities may induce maximizing individuals to allow their properties to deteriorate to the blight limit.

[10] For an elaboration upon the effectiveness of zoning and the connection between zoning and externalities, see my unpublished Ph.D. dissertation, "The Economics of Municipal Zoning," University of Virginia, 1959.

profitable for one or more entrepreneurs to remove the entire blighted area. After all, such action would, by definition, remove the external diseconomies.

It may be stated, as an answer to the above, that blighted areas are often too large for one entrepreneur to undertake their removal and that joint action by several is difficult to accomplish. Whether or not such an argument suggests governmental intervention with the market mechanism is, fortunately, a question that we do not have to answer here since the case for government action can be based upon other arguments.

Probably the most frequent argument for urban renewal states that it is often very difficult for an individual entrepreneur to assemble a large enough tract to make renewal feasible.[11] Only the government, which possesses the right of eminent domain, is able to assemble these large tracts. Taken at face value, this argument is hardly a valid reason for governmental intervention. However, if it is combined with the external diseconomies argument, then the implication is that a few property owners in the blighted area could both refuse to sell their property to entrepreneurs for renewal purposes and also refuse to make the necessary repairs which would so upgrade their property as to remove the external diseconomies, with the result being that rational private action would leave the area blighted. This argument implicitely assumes that these individuals are not acting so as to maximize the present value of their assets.

As an additional argument for governmental interference we might note a slightly different version of the previously stated public services argument. This version states that once an area is blighted an optimal renewal process often necessitates the reworking of street plans, the provision for parks, etc. Since the government is involved, why should it not undertake the entire process? The answer, of course, is that some type of governmental and entrepreneurial coordination are needed for almost every decision involving public services although the governmental role is often only that of providing a framework of rules under which individuals make their decisions. This problem essentially is not different in kind from multitudes of others that could be named and the argument, insofar as it is valid, must rest upon distinctions of degree. The real difficulty here is the pricing of the true public services for, unless this difficulty can be solved at least conceptually, correct distinctions of degree are impossible to make.

A final case for governmental interference may be based upon income distribution. It can be argued that government action is necessary to keep a particular subset of low income persons residing in housing above the arbitrary minimum viewed as necessary for decent living. While this argument certainly could not be used to justify today's urban renewal practices which sometimes include downtown areas, it is rejected in its entirety here on the logical and ethical principle that the allocation problem must be divorced at least conceptually from the problem of redistribution.[12]

Fortunately, for the purposes of this essay we do not have to obtain an absolutely precise answer to the question, "Why has blight occurred?" Presumably, the answer would lie in a combination of the above positions—the nature of the metropolitan growth process, the presence of external diseconomies which incorrect zoning has allowed to occur but which are an integral part of blight, and the inadequate provision of certain public services. What is important is that, in recognition of the demand that "something be done," we examine the situation and derive some criteria for policy makers.

### *The Pure Theory*

For the purpose of the following analysis we shall take as given the existing situa-

[11] For example, Raymond Vernon states: "As the city developed, most of its land was cut up in small parcels and covered with durable structures of one kind or another. The problem of assembling these sites, in the absence of some type of condemnation power, required a planning horizon of many years and a willingness to risk the possibility of price gouging by the last holdout." *op. cit.*, p. 53.

[12] This view is not to be interpreted as meaning that redistribution may not be desirable. The ethically correct income distribution may still be achieved through the Redistribution branch of the Musgrave budget, and, even if it is desired that the transfer be earmarked, such can conceivably be accomplished through a system of giving restricted funds to all families below a certain income level; thus not aiding only those who happen to be lucky enough to obtain shelter in the renewed area or in public housing that might be constructed in conjunction with renewal activity.

tion—that there is something which persons mutually recognize as blight and that they consider its existence "wrong" for some reason. We also take as given, by our very definition of the problem, that actions by private entrepreneurs in the present institutional environment have not resulted in the elimination of blight. Thus, despite what previously may have seemed to be dissent, we are assuming that some governmental action is necessary. The proper question now is, "What action?"

It should be noted that, in taking this position, we are ascribing some element of truth to the above arguments. In particular, we are saying that there may be external diseconomies present, that it may be difficult for an entrepreneur to assemble a large enough tract to make renewal feasible, that the state with its right of eminent domain is not faced with this difficulty, and that governmental action to ensure the "correct" amount of public services may be desirable.

It should be evident, at least to economists, that the need and constraint approaches to governmental expenditures may not necessarily result in the correct allocation of resources.[13] The need approach is defined as a method whereby a certain level of need is taken as given. That is to say, a certain project needs to be carried out; and, granted the requirement, money is sought for the project. The constraint approach is defined as a method whereby the amount available for expenditure is taken as given, the problem being to allocate this sum most efficiently. What is required for rational expenditure is that a careful comparison of schedules of cost and expected benefit be made in order to determine (1) whether the program should be undertaken and (2), granted that it is warranted, how much should be spent on it. Now this latter procedure is extremely difficult to accomplish in many areas of governmental activity. Fortunately, many of the difficulties are not present in the urban renewal case when the *correct approach* is adopted.[14]

[13] For a discussion of the criteria problem for governmental expenditures, including these two approaches, see Roland N. McKean, *Efficiency in Government Through Systems Analysis*, (New York: John Wiley & Sons, 1958).

[14] It should be noted at this point that the need approach underlies most of the present proposals.

Let us assume some city faced with a blight problem. Suppose that the citizens of our city have decided that private actions have allowed the blight to develop, that something is wrong with the situation as it stands, and that positive action must be taken. We shall also assume that the state legislature, which is the constitutional holder of the police power, has taken specific action to grant the right of eminent domain to the city.

Now let us assume that the city council decides to act as a rational entrepreneur. We shall, however, rule out the possibility of raising funds from increased taxes. We take the tax rate as given. Suppose that the city raises its money for the project by going into the market and borrowing, i.e., selling bonds. With the money raised through the bond sale, the city purchases the blighted area, using its right of eminent domain wherever needed. The city then demolishes the outdated structures, makes provision for adequate public services, and then, having finished its part of the operation, sells lots to rational entrepreneurs who have agreed in advance to build, say, modern apartment buildings. City action will have removed the previously cited obstacles to private renewal. The right of eminent domain removes the possibility of stubborn property owners acting so as to prevent the assembly of a large enough tract; each entrepreneur who buys the lots from the city is assured that adjoining lots will also be developed so external diseconomies are eliminated; and finally, entrepreneurs are also assured that adequate public services will be provided.

Now, what are the appropriate comparisons of costs and benefits? The costs to the local government, which we assumed was acting like an entrepreneur, would be revealed by a look at its income statement. These would include the acquisition of the land, the costs of improvements, and interest expenses. The measurement of revenues is more difficult. The primary item, of course, would be receipts from the sale of lots. Since we are dealing with the local government, there would be, however, an additional item that must be considered. City revenue is usually gained through property taxation and, if the project was successful, the new buildings should have

a higher value than the old. Thus there should be a net addition to tax revenues. This net addition, insofar as it stemmed directly from the project, should be discounted to a present value and counted as a receipt from the project.[15]

A comparison of revenues and expenses should indicate whether the project is profitable and this factor forms the basis of our criterion. If the expected revenue from a given renewal project exceeds the expected expenses, then the city council should undertake the project. If the expected revenue is less than expected costs, then renewal action sould not be taken.[16]

One fact needs to be emphasized here. The removal of externalites causes social and private products to be equated and, insofar as renewal eliminates externalities, the urban property market is moved toward the Pareto optimum. In fact, as long as there is competition in the construction industry and bids for the sites are competitive, then the city's net revenue from the project provides a rough measure of the effect or the value of the externalities.

### *Conclusions*

The criterion which we have derived for urban renewal—that a project should be undertaken only if it is expected to be "profitable"—has several important implications and limitations. These will be discussed in the following paragraphs.

As the first implication, we should note that the criterion was developed in city terms. Thus, if the proposed criterion is adopted, city action can remove the obstacles that supposedly prevent private renewal operations. It follows from this that federal and state programs are not needed and that many of the present proposals are misdirected.[17]

Although no state urban renewal program per se is needed, it is necessary that individual states take action on two fronts. First, it is required that state governments grant the right of eminent domain to cities for renewal purposes. Second, every state has enacted constitutional and/or statutory local debt limits. As a general rule these restrictions are based on the assessed valuation of property and vary from 1/5 percent (Georgia) to 40 percent (Nebraska school districts).[18]

So, with these limitations, it is quite conceivable that individual localities may have borrowed to the limit and thus be prevented from adopting a renewal program. It is generally supposed that tax and debt limit provisions reflect the fear of property holders that unpropertied groups will place an undue tax burden upon them but we have indicated that, insofar as the project is successful, no tax increase would be necessary. Thus, individual states should take action to remove restrictions that would prevent municipalities from borrowing for urban renewal purposes.

[15] It is necessary that the present value of the net addition to tax receipts be included on the revenue side since property taxes are shifted to the immobile resource, in this instance, land. If there were no property taxes either before or after the project, then the receipts from the sale of the cleared sites would equal total revenue obtained in the previous manner. This proposed scheme is not to be confused with the so-called Detroit plan, which really amounts to nothing more than a complicated manner of changing the tax rate.

[16] While it is not our intent to outline specific details of various methods whereby this scheme could be carried out, it should be noted that it is possible to devise methods of determining the profitability of any project prior to city action. For example, a project might be designed as tentative, estimates of land acquisition costs could be made from surveys, engineering estimates of "improvement" expenses could be made, tentative bids on "lots" could be "accepted" and estimates of the net tax increase from new structures could be made in order to see whether the projects would satisfy the criterion.

One note of caution is warranted. It is conceptually possible (although it seems rather improbable) that the urban renewal project be so large that the monopoly power could be generated, and the city might gain greater revenue by restricting the number of sites it put on the market. In such a case the competitive solution can still be obtained through the city's carrying out the project in small chunks.

[17] Most of the present proposals follow the general formula expressed in Title I of the 1949 Housing act. The cities are expected to buy land in blighted areas and resell it at a loss to private developers. At present, two-thirds of the loss is borne by the Federal Government and the remainder by the cities; and since the existing program is relatively small, the usual proposal calls for larger expenditures. In addition, some urge that the Federal Government bear a larger portion of the loss. State programs, with the exception of New York, are generally considered temporary.

The striking fact about these proposals is the utter lack of a relevant criterion for expenditures. How much should be invested in urban renewal? Competitive economic theory indicates that a firm maximizes profit by equating marginal revenue (price) and marginal cost. If there are positive profits, investment in the industry takes place. The result is the "correct" allocation of resources. This analogy should hold for the urban renewal case. If the city can make a positive profit from urban renewal action, then the result should be a better allocation of resources. However, if the return is negative, then we can only conclude that the action is not justified.

[18] Edward C. Banfield and Morton Grodzins, *Government and Housing in Metropolitan Areas*, (New York: McGraw-Hill Publishing Co., 1958) p. 106.

There are two additional points that merit our attention. It might be argued that the City Fathers might miscalculate and the balance sheet end up by showing a net loss instead of a profit. That such is a possibility cannot be denied. However, we should note that the democratic process should exert pressure upon the officials to be careful and, if a mistake were made and if it was desired that the city not go into default on its obligations, then the bonds could be paid off with normal tax funds by increasing the tax rate (if possible) or reducing expenditures upon services. The uncertainty of a possible mistake is faced by the management of any firm. What is of real importance in this case is not that we worry over the possibility of mistakes, but that we have a criterion to determine whether renewal projects should be carried out, and the profit criterion should work in this case.[19]

Finally, it can be argued that our analysis overlooks the redistributive aspects of some of the present proposals. Certainly public housing projects involve redistribution and so may many of the present proposals for urban renewal. However, insofar as redistribution is desirable, it should be recognized for what it is and not hidden under other names.

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[19] This statement should not be interpreted to mean that the profit criterion should be applied to all government actions.

# Book Reviews

*Public Utilities in American Capitalism.* By Martin G. Glaeser. New York City, New York: The Macmillan Company, 1957, pp. 607, $7.50.

Thirty years after his *Outlines of Public Utility Economics* (1927) Professor Glaeser finds that his earlier views "did not need to be radically revised," that "the going concern idea is again basic and provides a frame of reference." (p. vii) Despite numerous institutional changes, he sees no necessity for modifying his ideas to fit the new realities. He maintains this position by the questionable expedient of pouring new wine into an old cask—by forcing new organizations, technologies, industries and social objectives into the 1927 container.

Glaeser's "going concern" is a state-created, state-protected private monopoly. This concept goes beyond the old theory of *natural* monopoly, which was negative and limited, to a more positive and comprehensive theory of state-planned monopoly. Thus, the *natural* tendency toward monopoly is supplemented by the coercive power of government. He is so certain of the organizational and technological superiority of monopoly over competition that he would have government sanction the former and exorcise the latter. Reversing Adam Smith, he would have the state labor along with nature to achieve more perfect monopoly.

This is to be accomplished by a combination of privilege, suppression of competition, market control and protective regulation. He would "coordinate the many units of public and cooperative enterprise with each other and *with the private utility industry*" (p. 454, italics supplied). Public utility executives would become quasi-public officials. Regulation would preserve and advance the economic health of such going concerns, secure a balance of cost and income, maintain credit, and attract capital for expansion.

Glaeser projects a corporative model in which private and public power are unified—ostensibly to promote technological efficiency but actually to make the world safe for private monopoly. It would be applicable, with equal plausibility, to most large-scale industrial enterprises. He is driven to this extremity by the logic of his assumptions, specifically: (1) that going concern theory—a private monopoly construct—is applicable to the public service; (2) that monopoly is organizationally and technologically superior; (3) that competition, in whatever form, is inherently destructive and without value, either economically or socially; and (4) that public regulation can compel private monopoly to serve the public interest.

The most distressing feature of Glaeser's analysis is his failure to examine critically the sorry record of public utility regulation over the past thirty years. Had he done so he might have observed that, in fatuous pursuit of the very policies he advocates, it has degenerated into a subservient handmaiden of private monopoly. This was inevitable, given the commitment to monopoly and the mandate to protect monopolistic going concerns. As a consequence, regulation today has few defenders other than its privileged beneficiaries. Glaeser would not find himself in such questionable company had he adopted a more flexible and realistic approach, explored available alternatives, and examined public regulation more critically. He comprehends the need for social planning and integration but his favored institutional means for attaining it—private monopoly plus protective regulation—are certain to prove inadequate for the task.

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**Editor's Note.** *When the above review came in to the editor's office we were struck with the fact that Professor Gray had found no part of the book worthy of praise and that he*

*is indeed extremely critical of what seems to him to be Professor Glaeser's philosophy of the going concern. Professor Glaeser has for many years taught public utility economics at the University of Wisconsin (where this journal was founded thirty-six years ago). He has historical knowledge of and experience in the workings and growth of public utility regulation in this country.*

*Professor Walter Morton, who comments below on Professor Gray's review, has also taught many years in the Department of Economics at the University of Wisconsin.*

Professor Glaeser does not deal with and does not purport to deal with the regulation of business enterprise in general, nor does he imply that such regulation is either necessary or desirable. His work is rather what the title states: a study of public utilities.

Professor Glaeser shows the place of regulation in the reconciliation of private and public interests. In tracing the legislative and judicial development of regulation the author adheres to the long American tradition which protects private property and business management from arbitrary action by political or regulatory forces. He does not set up, as may be the wont in some circles, some abstract theoretical model of perfect competition or perfect regulation, compare it to actuality, bemoan the fact that the two do not coincide, and then turn to socialism.

Glaeser's book is not model-building but realistic economics. In this matter Professor Glaeser represents a continuation of the tradition found in Professor John R. Commons' *Legal Foundations of Capitalism and Institutional Economics* which accepts human society as it actually is with competitive forces as well as organized groups and monopolistic and monopsonistic elements. Professor Glaeser's objective in this book is not to set up abstract models or to devise a pattern for the control of American industry in general. No responsible person, so far as I know, today advocates competition in a given area among many utilities in the supply of electricity, telephones, water or gas; and the American community also believes in the virtues of private management and private ownerships of utilities. Where the country departs from private ownership and management it has also given to such public management, tax advantages which makes the competitive race an unequal and unfair one.

I do not believe that anyone has demonstrated and I do not believe it to be true, that the public utility concept would be, as Professor Gray indicates in his review, "applicable, with equal plausibility, to most large-scale industrial enterprises." Consequently, Professor Gray's critical contention that Professor Glaeser, or anyone else who believes in regulated private utilities, must also adopt a position favoring general public regulation of business enterprise is a non sequitur. Other industries are not natural monopolies.

The inherent economic tendency toward monopoly existing in public utilities is, as Gray points out, reinforced by legally conferred monopoly privileges. If this is bad, what is the alternative? Should monopoly go completely unregulated? Should perfect competition be attempted? Or, should we turn toward collectivism? Professor Commons, who founded the institutional tradition which Glaeser follows, called himself the Last of the Mohicans of liberalism. To him, institutional economics was a means of maintaining private property, private management and individual liberty in a world increasingly dominated by large entities and organized groups. He was not a collectivist. He was an individualist.

Any reader of Glaeser's book will know that he has devoted more than 200 pages to the development of regulation and he simply does not share Gray's poor opinion of the results of the regulatory process during the past thirty years. That Glaeser could utilize the basic structure of his original pioneer work in the present volume is of course no ground for depreciation of his effort. It shows, on the other hand, that the basic economics, law and administration of public utilities, is still much the same as it was when he first laid the foundation for future studies. There is no reason to sacrifice truth for mere novelty or to the fads or ill-conceived doctrines of the times.

There may be some who, preoccupied with heroic abstraction, believe that the choice of policy must be between the model of perfect competition or actual collectivism. Since the perfectly competitive model is not and cannot be realized in fact, they admonish with the false disjunction to "atomize or socialize."

These alternatives may follow impeccably from some abstract model but they are realistically puerile.

The study of concrete institutions shows that the economic process in a democracy may be inefficient and quite unsatisfying when judged by some ideal plan, but it can be improved only by concrete measures and not by retreat to the escape mechanism provided by unrealistic abstraction. Whatever heuristic merits such abstract models may have, no conclusions regarding economic policy applicable to the real world flow from them. Since they do not purport to describe our actual institutions, it is not the intellect but the feelings which make the jump from the existing institutions into some sort of heaven. Although this type of model thinking is in the vogue at present, there is no reason why authors familiar with the actual operations should be entranced by it. The individual thinker has the liberty to indulge himself in whatever art forms he pleases but responsible public officials, judges, commissioners, or business management must operate within the existing society and improve the institutions that actually exist. In that respect they are all institutional economists.

Gray's verdict that "private monopoly plus protective regulation are certain to prove inadequate" for the future is one that is hardly borne out by the tremendous progress made in the utility field since Glaeser's first work thirty years ago.

WALTER A. MORTON

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*Public Housing in Action: The Record of Pittsburgh.* By Robert K. Brown. Pittsburgh, Pennsylvania: University of Pittsburgh Press, 1959, pp. 107.

For the first time since federally aided low-rent public housing was launched in the 1930's, a book has been published about the program's financial impact upon one community. In his 107-paged *Public Housing in Action*, Robert K. Brown has set forth *The Record of Pittsburgh* through 1955-1956. He has also briefly discussed the legislative evolution of federally aided public housing, and has proposed a rent-subsidy plan as a preferable alternative to the present low-rent program.

Studies of local benefits and costs of our multi-billion-dollar federal, state, or city housing programs are sorely needed. Many have operated for at least a decade and have without doubt stimulated profound changes in local real estate markets. Yet few economists have studied local markets to identify and evaluate the changes and to recommend improvements.

Especially welcome, therefore, is Mr. Brown's book on Pittsburgh, designed to "investigate the legislative evolution of the public housing program and to illustrate its financial impact, especially on a specific community." Unfortunately, *Public Housing in Action* falls short of providing a complete analysis of the program's financial impact, in this reviewer's opinion. For one thing, the exposition is mainly factual rather than analytical. For another, measures of its impact are limited chiefly to capital outlays and to federal and local contributions to project operations. Within these limits the author has summarized the dollar volume of public housing construction and financing as well as the federal cash payments of annual contributions. He has also itemized local contributions to the projects.

A major feature of *Public Housing in Action* is its discussion of tax exemption and payments in lieu of taxes. Here Mr. Brown concludes that "public housing is not bearing its fair share of the cost of municipal services furnished to the project tenants." As proof, he rather arbitrarily selects three areas in Pittsburgh of privately-owned substandard housing, occupied by about 600 families, with unspecified incomes. Mr. Brown then computes average tax payments, which he apparently equates with tax assessments, per occupant family for each of the three substandard areas during 1955. He finds that these average payments were larger in 1955 than average payments in lieu of taxes on behalf of over 7,000 families in the nine public housing projects. Finally, Mr. Brown assumes that the per capita cost of municipal services rendered to each of the three substandard areas is the same as that rendered to the nine public housing projects.

Based on these techniques and assumptions Mr. Brown asserts that "the study results indicate that public housing projects require a larger subsidy than the slum housing area[s]."

But this conclusion would seem to follow only if per capita costs of municipal services were in fact identical for substandard housing as well as for public housing and if families occupying substandard housing fell within the same restricted income range as those in public housing projects. What might have been found if the variables had been analyzed over a period of time rather than in only one year, or if some other substandard housing area had been selected? These points underline the complexity of the issue and the need for more research, now that Mr. Brown has cleared a path.

In the final portion of his book the author offers further conclusions and recommendations. He feels that the present program cannot provide assistance to needy, displaced, low-income families "on a scale which will begin to approach the dimensions of the problem." In place of the current program the author outlines a rent-subsidy plan which appears "to have sufficient merit to warrant a limited trial and, if this is successful, a full-scale trial," Small-scale experiments of this and many other kinds might well be made, in this reviewer's opinion, to test their effectiveness and gauge their potential costs.

*Public Housing in Action* thus opens the way for additional local housing experiments and studies. These might include more than the chronological narration typical of Mr. Brown's review. For example, they might analyze changes in private property values—including dwellings with federally-underwritten mortgages—for parcels near public housing projects; some work has already been done on changes in private property values near public highways, airports, and parks.

In considering the financial impact of public housing on localities perhaps the questions to be asked first are *how much* impact upon *whom* or *what*? The impact may extend far beyond anything indicated by municipal budgets and tax returns. What, say, happens to the expenditure patterns of families who move into or out of public housing, or are displaced from project sites? All this awaits for future studies to show.

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*The Fiscal System of Venezuela.* By Carl S. Shoup et al. Baltimore: Johns Hopkins Press, 1959, pp. 491, $8.75.

This is a report on the fiscal system of Venezuela by a commission of economists and tax law professors from the United States and Great Britain made at the request of the government of Venezuela. The commission was impressively manned and its product, notwithstanding an extremely short investment of effort, will qualify as something of a model for studies of this kind.

All countries of course are unique but Venezuela seems uniquely qualified to be so described: a lop-sided distribution of income and wealth; a very productive tax system based largely on oil royalties; an economic growth of some 9 percent per annum during the 1950s (population increase 4 percent per annum); a level of general education relative to income one of the lowest in the world; local government and finance almost nonexistent.

The authors find a weak system of income taxation: a nine-schedule system of differentiated levies plus an over-all complementary schedule; same rates applied to corporations as to individuals; dividends exempt; and so forth. Surprisingly the level of honesty and efficiency in administration is reasonably good. Authors recommend a single schedule system for individuals; independent tax for corporations, with a partial credit to mitigate double taxation. Moderately more reliance on progressive income taxes confronts shortage of capital and impressively high saving by high-income recipients; nevertheless it is recommended on the grounds, among others, that more outlay for education can yield a very high rate of return.

Other recommendations include a repeal of a half-percent gross income tax; revision of custom duties and their administration; development of a tax on motor fuel as a user-tax to support highways; and a strengthening of the real estate tax in urban areas. The latter, in view of urban growth, might differentiate to favor improvements over land.

All tax policy recommendations must be highly conditioned by the circumstances of time and place. Against this background most of the above-mentioned recommendations (and many others) appear to the reviewer eminently reasonable and ably-defended. Without benefit of more orientation, he does regret that the committee did not take a stronger stand for the development of local self-government.

The book will be highly useful in many ways among them its addition to the meager literature in English about the fiscal institutions and problems in underdeveloped economies.

HAROLD M. GROVES

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*Caucasians Only*. (The Supreme Court, the NAACP, and the Restrictive Covenant Cases) By Clement E. Vose. Berkeley and Los Angeles: The University of California Press, 1959, pp. 296. $6.00.

In *Urban Redevelopment: Problems and Practices* (1953) this reviewer contributed a section on "Private Covenants in Urban Redevelopment" (pp. 223-309). This was stated to be an attempt to relate some complex and obscure doctrines of real property law to the needs of modern urban renewal. At that time I suggested that "the debate of the last five years over the undesirability of racial covenants has perhaps obscured the usefulness of the device of private contract as an affirmative, constructive tool in community building." (p. 228)

*Caucasians Only* began as Professor Vose's thesis for a doctorate in political science. It is a useful book. It happens not to put the battle over racial covenants into the larger setting that I adumbrated. There is a chapter on "Legal Precedents" but it is largely a review of dozens of cases in state courts specifically dealing with racial covenants. I note with pleasure that Vose, too, slaps the smugness of the American Law Institute's *Restatement of Property*, which, in 1944, on behalf of "the top brass of the American legal profession" pronounced racial covenants reasonable and valid restraints on alienation.

Vose says that his chief concern was "to learn something of the role of interest groups in the judicial process." This is a proper concern for a political scientist. It leads him to chronicle from its beginnings the history of the National Association for the Advancement of Colored People; to recount the evolution of its legal strategy; to report the forces involved in instituting covenants in Washington, St. Louis and Michigan; and to describe in detail the preparations for and the consequences of the Supreme Court cases.

The volume has usefulness, too, for students of urban redevelopment. I cite three instructive examples. First are the stories, pieced out from interviews with local real estate brokers, lawyers, and neighborhood characters, of the initiation of covenants and the methods used to enforce them. We have here a curious phenomenon. On one side, the NAACP, with nation-wide strategy, framed by a network of able Negro lawyers, backed by some of the ablest constitutional lawyers and sociologists in the country; on the other side, dozens of little neighborhood groups in various cities that seem to crawl out of the woodwork, not backed by any national group, either of real estate men or segregationists! The urban renewal practitioner will bump into them and their like in the much touted community organizations that today are deemed the indispensable concomitant of renewal projects; they are usually just as parochial and obstructionist in this setting, despite Mrs. Abrahamson's recent book about Hyde Park, Chicago, *A Neighborhood Finds Itself*.

Another element of Vose's history for urban redevelopers to ponder is the contribution of Professor D. O. McGovney in his famous article in the *California Law Review* in March 1945: "Racial Restrictive Segregation by State Court Enforcement of Restrictive Agreements, Covenants or Conditions in Deeds Is Unconstitutional." Here was presented for the first time systematically (it had been hinted before) the argument that court enforcement of these private agreements was "state action" forbidden by the 14th Amendment. This was the time bomb! A creative

piece of legal thinking that "gave the Negro cause a solid constitutional theory with which to attack the older notions of the law" (p. 70).

Finally, our urban redevelopers should reflect upon Vose's unhappy conclusion. The sweeping victory in the Supreme Court decisions somehow did not open the housing market freely to Negroes, as the jubilant Negro press headlined that it would on the day after the decision.

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## Colorado Conference of Utilization of Water

The second annual Western Resources Conference will be held at the University of Colorado in Boulder Aug. 22-26. Theme of the conference will be "Water: Measuring and Meeting Future Requirements," according to chairman Morris E. Garnsey, professor of economics. Co-sponsors with the University of Colorado are the Colorado School of Mines and Colorado State University.

The seminar, expected to have at least 150 in attendance, is part of a nation-wide effort to focus attention on study of and planning for utilization of natural resources.

Participants will be from both public and private agencies seeking to increase knowledge on resource development, conservation and use. United States Senator Gale W. McGee (Wyoming), a member of the Select Committee on National Water Resources, will be keynote speaker on the subject, "Water Requirements and Water Policy." Further consideration of the subject will be directed by Theodore M. Schad, staff director for the committee. Regional problems will be surveyed in sessions on:

*Pacific Northwest*—planning—Warren H. Marple, executive secretary, Columbia Basin Inter-Agency Committee, and Leonard B. Dworsky, member of the committee.

*South Platte Basin*—future water requirements and supplies; institutional and legal framework for optimum water use—speakers to be announced.

*California*—"The Water 'Industry' "—Julius Margolis, School of Business Administration, University of California.

*New Mexico*—"Income Effects of Water Use Patterns"—Allen V. Kneese, industrial economist, Federal Reserve Bank of Kansas City.

*Colorado River*—"A Synthetic Hydrology"—Paul Julian, resident staff, High Altitude Observatory, and Leslie Fishman, assistant professor of economics, University of Colorado.

Vernon W. Ruttan, associate professor of agricultural economics, Purdue University, will present "Regional Projections of Irrigated Acreage and Irrigation Water Requirements."

Floyd Dominy, commissioner, United States Bureau of Reclamation, will discuss "Research Requirements for Multiple Purpose Water Development."

Conceptual problems in demand projection will be discussed by S. V. Ciriacy-Wantrup, professor of agricultural economics at

the University of California. Problems of arid areas will be presented by Cecil H. Wadleigh, director, Agricultural Research Services.

There will be two conference sessions on water and recreation. Lawrence Hewes of the Outdoor Recreation Review Commission will lead discussion on recreation requirements for water. Frank Brockman, professor of forestry at the University of Washington, will talk on "Recreation and Water in the West."

The final day of the conference will be devoted to the role of the university in water research and in training researchers. Richard A. Harvill, president of the University of Arizona, and a panel will discuss the subject.

## Harvard University: Graduate School of Design

Beginning in the academic year 1960-61 the Graduate School of Design at Harvard will offer an advanced interdepartmental program in URBAN DESIGN, open only to selected candidates from among those who already hold one of the school's first professional degrees (B.Arch., M.L.A., or M.C.P.), or who are deemed to have had elsewhere an equivalent preparation. The program will require a minumum of one year's study in residence and will lead to the degrees Master of Architecture in Urban Design, Master of Landscape Architecture in Urban Design, or Master of City Planning in Urban Design, depending upon the profession in which the candidate already holds his degree and through which he comes to the curriculum in Urban Design.

The curriculum, under the supervision of Dean José Luis Sert and with participation by Faculty members from all three departments of the School, will consist of three major components:

1. *STUDIO COURSE IN URBAN DESIGN:* At least two terms of an intensive studio course, with problems conducted conjunctively rather than collaboratively, so as to give all members of the class a joint experience in the three professional aspects of the work. The Fall Studio Course will concentrate on such themes as new development, a new town, or part of a city including residential, commercial, cultural, recreational, and possibly industrial elements. The sequence will cover programming, site analysis, design, and presentation, with special emphasis on the design and presentation phases. The Spring Studio Course will concentrate on such themes as rebuilding on a large scale, with different kinds of buildings and land uses requiring the blending of new and old functions and structures, or on a more detailed civic core study. The sequence will cover programming, community analysis, design, staging, and presentation, with special emphasis on the last three phases. One or more short sketch problems may be given in the Fall and Spring Studios; these will be an outgrowth of a larger general problem and may emphasize the interrelationship of the visual arts.

2. *SEMINAR ON FACTORS THAT SHAPE THE CITY:* At least two terms of a weekly seminar, offered jointly by the three professional departments, on the physical and cultural factors that underlie and tend to generate the forms of the urban environment. The work will be integrated with the main issues arising in the Studio Course and will cover such factors as: the physical landscape;

the geography and land use of the region and the city; population and sociological factors; work and economic activities; transportation systems and their impact on our way of living and on design factors; utility and service requirements; living, shelter, and their interrelationships; play and cultural expression; human values and aesthetics.

3. *SEMINAR ON THE SHAPING OF URBAN SPACE:* At least two terms of a weekly seminar, also offered jointly by the three professional departments, covering historically and critically a study of the actual physical forms of the urban environment. Along with appropriate examination of design problems arising in the Studio Course, this seminar will cover such formal and historical elements as human scale in relation to urban design and the shaping of such spaces as residential sectors, civic cores, cultural and religious centers, work places, shopping and meeting places, and recreational areas, with emphasis on different groupings of buildings and on their relationship to street spaces, expressways, squares, and parks. Each subject will be examined in terms of contemporary design through its development in the history of western and non-western cultures.

Students in the Urban Design curriculum will also participate and collaborate in the URBAN DESIGN CONFERENCE that will be held in the spring of 1961.